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ABSTRACT

In many communities, garbage disposal--solid waste management--is the third largest municipal expenditure and a fast growing budget item. Many small local governments have controlled the growth of these costs by recycling up to 40% of the total solid waste they produce. This guidebook can help communities identify and develop opportunities available through recycling. Chapters cover: (1) recycling as part of an overall community strategy to deal with limited landfill space, rising disposal costs, stricter federal and state regulations, and environmental problems; (2) information gathering and problem assessment to locate the right solutions to solid waste problems; (3) locating buyers and creating a market for recycled materials; (4) making decisions in the design of a recycling program; and (5) educating the public through media coverage, flyers, school programs, and other approaches that encourage household and business participation. Appendices include state government recycling agencies; state recycling associations; a selected bibliography of 24 books, reports, journals, school curricula, and EPA publications; and an outline of financing options. (SV)

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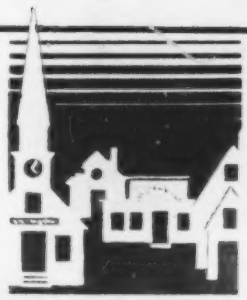

a small town guide to recycling

National Association
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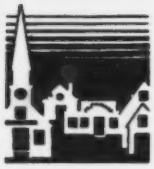

Why Waste A Second Chance?
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This guidebook is part of a training package, which includes a video and user's guide. It is one of a series of packages designed to improve the delivery of services to rural people through management training for small town officials.

This training package was funded by a grant from the W. K. Kellogg Foundation of Battle Creek, Mich.

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introduction

how this guide will help

Recycling is the reuse of waste products such as paper, glass and cans in the manufacturing of new products. Much of what we discard as trash actually has value when separated and collected according to buyer's specifications. A number of small communities now recycle between 25 and 40 percent of the total solid waste they produce. These efforts save money, preserve landfill space and protect the environment.

Why Waste a Second Chance?, a training package for small town leaders, will help your community identify and develop the opportunities available through recycling. The entire package, or training module, includes this guidebook, a 12 minute video focusing on small community case studies and a user's guide to assist in conducting training sessions. Information on the purchase or rental of the module is available through the National Association of Towns and Townships, 1522 K Street N.W., Suite 730, Washington, D.C. 20005.

In many communities, garbage disposal, or solid waste management, is the third largest municipal expenditure, ranking behind only schools and roads. It is a fast growing budget item with the cost of collection, disposal, insurance, transportation, and related expenditures all contributing to the steady, and sometimes dramatic, annual cost increases for delivering this service. This guidebook explains how small local governments have successfully controlled the growth of these costs by recycling – finding new uses for goods and materials which would normally end up in the landfill.

While recycling is only part of the solution to better management of solid waste, it offers the greatest potential for small governments to reduce their reliance on traditional disposal methods. Recycling involves several steps in addition to the collection of a particular waste product. *Why Waste a Second Chance?* provides a framework for understanding and answering the following questions:

- How does recycling work and where does it fit into the overall management of solid waste?
- What specific problems is solid waste causing for your community? What goes into your landfill and what might be recycled for financial or environmental reasons?
- Which recycled products are marketable? What strategies will create the strongest demand?
- How does a community design a successful and affordable recycling program which may also involve public, private, non-profit and regional organizations?
- How does a small local government create and maintain a meaningful commitment to recycling at both the community and business levels?

While there is no one way to implement recycling, local officials have gone through many of the same steps to arrive at the right solution for their communities. Based on real world experiences of small localities across the country, this guidebook provides a chapter by chapter analysis of how to ask the right questions and where to find the right answers.

The very real problems posed by solid waste must be met with solutions that have a successful track record. The selection of case studies and management strategies for this guidebook was influenced by the following considerations:

• Small towns are not the same as big cities. Urban approaches often cannot be scaled down to meet small community and rural needs. Therefore, the examples in this guidebook are drawn entirely from communities of 1,100 to 35,000.

• Changes in handling solid waste are likely to happen gradually, not rapidly. Most state and local governments have not passed mandatory recycling laws. While some studies claim that 70 to 80 percent of all garbage can be recycled, the U.S. Environmental Protection Agency's five year Agenda for Action calls for an attainable 25 percent recycling target by 1995. Many communities have achieved a higher rate without ordinances which make recycling mandatory. Programs often begin by recycling a single product while building support for more comprehensive recycling in the future.

• Small community roles in solid waste management vary considerably. Waste reduction and recycling may involve private haulers, public works departments, drop-off centers operated by non-profit organizations, or separation of recyclables at the household or business level. The guidebook examines a number of management alternatives that balance the roles of government and the private sector.

• Recycling alternatives are discussed in terms of the possible. Small community responses to the solid waste issue are limited by available finances, staff and equipment. These constraints are taken into account in the overall discussion of recycling, and particularly in relation to the collection, processing and marketing options.

In spite of these real world limitations:

• A New Hampshire town of 5,000 consistently achieves a 40 percent annual recycling rate by aggressively marketing a wide range of separated materials to area manufacturers.

• A Washington lumbering community of 1,100 has cut its landfill costs more than 30 percent by composting food waste with sludge to form a high grade top soil additive.

• An Ohio township of 1,300 recycles enough of its paper and glass to pay for collection costs and tipping fees for garbage that is landfilled.

While circumstances differed among each of these communities, there were common grounds for success. Based on the experience of these and other successful community programs, the guidebook presents a process for identifying and solving local problems. The key elements in establishing a program are: analysis of local waste problems, identification of markets, separation, collection and preparation of recycled materials, and public education.

Recycling, however, is a dynamic rather than a step-by-step process. Collection techniques, for instance, should be chosen with public education in mind. And the decision to recycle particular products should take into account the proximity and dependability of potential buyers.

Why Waste A Second Chance? is based on the premise that recycling and other waste management alternatives can help many small communities reduce their reliance on the two major methods of waste disposal currently in use across the United States: landfills and incineration.

chapter 1

small towns and solid waste

"The problem with garbage is that everybody wants us to pick it up, but nobody wants us to put it down."

--a local government official

In 1987, a barge filled with New York garbage was turned away from one port after another. That well publicized sight convinced many people that the solid waste crisis had, in fact, arrived. Yet this "floating landfill" was carrying the same kind of garbage produced in small towns and big cities across the country. Suddenly, what we threw away wouldn't go away. No one was willing to accept the discards of our "disposable society" which continues to throw out most of its paper, glass, cans, packaging and plastics. How did we end up with garbage-on-a-barge? Consider these sobering facts from the U.S. Environmental Protection Agency (EPA):

- The average American produces nearly four pounds of solid waste each day;
- More than 80 percent of all municipal trash is landfilled, while less than 10 percent is recycled; and
- Thirty-five percent of the nation's existing landfills will close by 1992.

Added to these are two other equally sobering facts that local government officials should consider:

- New siting and monitoring requirements will greatly increase the cost of operating a landfill; and
- For those municipalities that haul their trash to a distant landfill, tipping fees will double, triple and even quadruple in some areas of the country.

If left to its own devices, our waste stream — the material we throw away — will increase at an alarming rate as Americans continue their established habits of throwing out all the "trash." And manufacturers likely will continue adding to the waste stream with disposable packaging that is either hazardous or takes hundreds of years to decompose.

you are here

For years, solid waste has been "out of sight, out of mind." Disposal was handled through weekly pickup by public or private haulers or a once-a-month trip to the county dump. Recycling was limited to sporadic paper drives most often conducted by charitable or service organizations. Only the closing of a landfill or a major threat to the environment could make solid waste a local priority. Even when a crisis did occur, local leaders remained, until recently, unaware of the role that recycling and other strategies could have played in preventing or managing these problems.

In many of America's small towns, there is still time to deal with emerging solid waste problems while landfill space remains available at a reasonable cost. Successful recycling programs do not happen overnight. A year or more is usually required to put a new waste management program in place and to establish the necessary public support. When financing, convenience and environmental impact are calculated, recycling is not always the obvious alternative to landfilling. Public officials, then, should be prepared

to document the costs and benefits of both current and proposed methods of waste disposal — now and into the future.

The crisis in solid waste may affect small towns in four areas: landfill space, disposal costs, stricter regulations and environmental impact. While few are challenged to find the immediate solutions necessary for New York, Chicago, and other metropolitan areas, sooner or later every small community will have to deal with the short and long term implications of one or more of these four areas.

Landfills. Many existing landfills will close in the next five years; and, according to EPA, nearly 70 percent will close by the year 2000. Even in areas where space exists for new landfills in small towns and rural areas, public opposition and the cost of environmental safeguards limit the development of new sites.

Disposal costs. In some regions, particularly near the East and West coasts, disposal costs (or tipping fees) have reached $65 to $100 a ton. Many small governments report that the $6 to $8 a ton tipping fees of recent years have risen to $15 to $20 a ton, with additional increases expected.

Stricter regulations. For years, landfills have accepted paints, motor oil, household hazardous waste, and other trash, all of which pose significant threats to the soil and groundwater. Strict new landfill regulations issued by EPA will further drive up the cost of landfilling as current and future sites must eliminate environmental hazards through protective liners and groundwater monitoring devices.

Environmental impact. While higher service fees are politically unpopular, the most compelling reason for new solid waste management strategies seems to be a growing public and private concern for the environment. Based on these current trends, neither landfills nor incineration are likely to be the most cost-effective answers to future solid waste disposal.

But landfills and various burning options will continue to play an important and necessary role in managing solid waste. Most communities may wish to work towards changing the percentage of garbage that is landfilled and removing hazardous materials before they can cause environmental damage by being buried or burned. Landfilling must move from being the automatic choice to the choice for those waste products which cannot otherwise be disposed of reasonably and cost effectively.

National trends provide a framework for understanding and predicting local solid waste problems, but they should not be the basis for specific local solutions. In order to make informed choices, a community, quite frankly, has to "know its own trash."

overall strategy

In rural areas, the percentage of garbage that is landfilled often exceeds the national average of 80 percent. Lack of facilities and the distance from markets are largely responsible for the minimal use of incineration and recycling in non-metropolitan areas.

Many waste products, however, have no secondary usage and even the most optimistic environmentalists expect a gradual, rather than a radical, transition from dependence on landfills to other solid waste solutions.

The place to intervene in the waste generation process, then, is at the beginning rather than the end. Both landfills and incineration facilities operate longer and more safely if less garbage or solid waste is processed and if hazardous materials are separated out. Many smaller governments do not own or operate their own landfills or burning facilities. But the ability to control the size and makeup of the waste stream leaving your community can save landfill space and tipping fees, protect the environment, and even produce income from the reusable and recycled products.

recycling and related issues

The balancing of techniques to encourage preservation of resources and protection of the environment is often referred to as **integrated waste management**. This strategy includes recycling as well as source reduction and reuse. All three practices result in lowering the quantity of waste which must be landfilled or incinerated.

At present, recycling is a well defined process with successful small town examples operating across the country. On the other hand, far less is known about the impact of reduction and reuse. Both represent a general approach with great potential rather than a widely established practice. Local leaders should be familiar with both concepts, however, since they are central to federal and state solid waste programs and policies.

According to the Environmental Defense Fund, "Recycling is the conversion of materials otherwise destined for disposal into useful materials or products. Recycling can only be said to occur if those materials are actually put to use." This definition captures the importance of looking forward to where the collected materials ultimately will be used.

Source reduction and reuse share the goal of creating less to begin with and using it longer. For example, a returnable bottle is used an average of 17 times. The result is 16 fewer bottles for which raw materials and energy are needed and 16 fewer bottles to recycle. Karen Wendt summarized the goals of source reduction and reuse in her book, *Damming the Waste Stream:*

- If you don't need it, don't buy it;
- If you do need it, select a high quality and durable brand;
- If it breaks, get it repaired;
- If you no longer need it, give it to someone rather than throw it away.

While the percentage of source reduction achieved

in the future will depend largely on a change in consumer preference (as well as state, federal and industry initiatives), some (mostly larger) communities already are limiting the use of plastic packaging and containers used in products that can be marketed locally. Suffolk County, N. Y., has banned plastic packaging such as "foam"containers, grocery bags and food wrappers which are made from environmentally damaging chemicals. Similarly, Newark, N. J. has proposed a ban on non-biodegradable packaging found in plastic diapers and milk containers.

Purchasing in bulk, using refillable containers, sharing equipment, are all generally applicable approaches which reduce the amount of waste generated by government. While waste reduction efforts may seem small or incremental, they represent a permanent solution. The former source of waste is gone -- no disposal, no collection, no recycling, no landfilling.

Reuse of a product depends on the purchase of an extended life, rather than disposable, item initially and on routine maintenance and replacement when appropriate.

The "life cycle cost" principal, which is routinely applied to major projects such as schools or wastewater facilities, may be applied to smaller purchases as well: office equipment, police and fire vehicles, playground equipment.

Photo by Maguire-Reeder, Ltd.

Rising landfill costs are a major incentive to start recycling. Disposal costs were a principal consideration when Peterborough, N.H., passed an ordinance making recycling mandatory. Since the program was set up in 1980, John Isham, town administrator, said disposal costs in the area have more than doubled.

Newberg Garbage Service Inc., a private waste management firm in Newberg, Ore., reuses five gallon plastic containers from ice cream parlors and other vendors as recycling receptacles for its residential customers, giving these containers an environmentally sound second life.

Minnesota's landmark Environmental Policy Act of 1973 best summarizes the integrated waste management alternative: "conserve natural resources and minimize environmental impact by: encouraging extension of product lifetime, reducing the number of unnecessary and wasteful materials practices, and recycling materials to conserve both materials and energy."

This guidebook focuses on the recycling aspect of integrated solid waste management.

chapter 2

all trash is not created equal

"Trash is just a resource out of place."
–Michigan township official

The once simple task of trash disposal has become the complex issue of solid waste management. Implementation of a waste management strategy requires small town leaders to answer four basic questions:

- What is the **quantity** and **composition** of solid waste produced?
- What **means of disposal** currently are used?
- What **problems** may result from continuing current disposal methods?
- What **costs and benefits** are associated with recycling when compared to other disposal alternatives?

Before establishing or expanding a local recycling program, communities need a number of tools to answer these questions. **Identification of the problem is a critical first step** before moving on to marketing, management and public education options.

Many American towns and cities are being overrun by the garbage they create. Landfills are closing or are near capacity; disposal alternatives have reached $60 to $100 a ton in some areas; and environmental problems from burying or burning trash are affecting soil, air and water.

Five years ago, major cities, whose garbage problems are now front page news, were unaware of the coming crisis. Even now, some communities don't foresee a problem for themselves. A rural official said recently, "People aren't willing to change here in Texas. With all this space, they think we can just keep building new landfills."

But the problem has caught up with other areas. "The reason behind the town's mandatory recycling ordinance was the high cost of solid waste disposal ($30 to $40 a ton). But it's my personal opinion that whatever we put in the ground will come back sooner or later to haunt us," said John Isham, town administrator of Peterborough, N. H. (pop. 4,800).

For most small town leaders, solid waste management that goes beyond landfilling is new and confusing territory. Recycling managers, however, agree that the first step in a community's waste management program is identification of materials that go into the waste stream. In short, know your trash, then decide how best to manage it in view of various alternative approaches.

what is trash?

Garbage, according to Webster's New Collegiate Dictionary is both "worthless and unnecessary." Until this century, most waste products were discarded without a second thought. When removed from inhabited areas, the impact of trash on human life and the environment was minimal since it contained no plastics or toxic chemicals and little glass, metal or special packaging. Garbage, for the most part, decom-

posed into harmless organic matter.

Household and commercial waste have grown enormously in both volume and complexity. Technology, the chemical revolution, planned obsolescence and disposable packaging have created an avalanche of new, and potentially harmful products.

In most communities, this diverse stream of material is still treated uniformly as "trash." Food, paper, glass, unused household cleaners, and so forth all go into the same trash can and eventually end up in the same garbage dump. Too many cooks spoil the broth, and too many forms of trash create a toxic stew that threatens groundwater, soil and nearby human and animal life.

The present method of garbage collection and disposal used by most communities has given rise to a host of problems: limited space for landfills, rising costs and threats to the environment. While the obvious solutions are to reduce the volume and/or hazardous content of solid waste entering the landfill, these goals are extremely difficult to reach once all forms of trash are mixed together. Solid waste, then, must be understood as a composition or compound of distinct materials that either lose their worth or spread their harmful effects when combined. The adage, "united we stand, divided we fall," should be reversed when applied to solid waste.

what we throw away

At first glance, garbage dumps or landfills look pretty much the same. But over time the nature of what we discard has changed, and today the volume and type of trash coming from two similar sized communities may vary greatly. Before a community can determine what might be salvaged or reused, it must know what is being thrown away. The EPA has funded several studies which characterize the typical content of municipal solid waste. These studies provide communities with a general idea of what may be found in the local waste stream. In addition, the broad categories into which waste is divided suggest that certain materials are prime candidates for reuse, recycling or reduction.

Chart 1 shows the composition by percentage of material of an average American community's waste stream. It should be used only as the broadest of guides. The data is national; it is drawn from both large cities and small towns; and it does not distinguish among rural, residential or largely commercial areas. But two categories which represent over half the nation's total waste (paper and paper board and yard waste) offer substantial recycling or reduction opportunities to the typical city, town or township.

While the figures for these broad categories are generally true, they can be used to illustrate that a little knowledge can be dangerous, or at least misleading. Newspaper is widely assumed to be the major contributor to the waste paper category, yet cardboard or corrugated packaging represents 50 percent more of the national total than newsprint. This type of packaging, on the other hand, comes primarily from commercial rather than residential sources and may not be a significant problem in rural areas or in "bedroom" communities. Similarly, yard waste takes up a fifth of the landfill space nationally, but fluctuates greatly in volume with the change in seasons and

Communities must know how much garbage they dispose of and what is in it before identifying problem areas and possible solutions. Millions of tires which end up in landfills each year may be ground up and used in paving materials or in incinerators to produce energy.

Photo by Maguire-Reeder, Ltd.

may be virtually non-existent in arid or warm weather regions of the country.

The point is clear that communities must know how much garbage they dispose of and what is in it before identifying problem areas and possible solutions. Chart 2 provides a more detailed look at the various materials which we Americans throw away. The figures illustrate that some products are of concern because of the percentage they contribute, in total waste, while other materials (motor oil, for instance, at one percent or less) require attention because of the substantial environmental problems they cause.

The first step in problem identification, then, is analyzing the composition of the waste generated in your community. Not all trash ends up in landfills, even in rural areas. Estimates or actual analyses should be conducted for all trash, or the total waste stream, not just the portion currently collected or dropped off at the landfill.

Professional analysis of community waste provides accurate data but is likely to be expensive and require considerable time to schedule and research. As a substitute, local governments may use proxy figures which will allow them to estimate the composition of their waste stream (by percentage and weight) once they know the total amount. Estimates of both the amount and composition of local solid waste may be available from one or more of the following sources: state recycling or environmental agencies (listed in appendix a); county planning or public waste department data on solid waste collection; solid waste studies conducted by regional planning organizations or neighboring communities; and collection and disposal records of local haulers and landfills.

Chart 1

Components of Municipal Solid Waste

Source: Franklin and Associates, 1986

one city's experience

In 1987, officials in Morton, Wash., a rural lumbering community of 1,100, realized they had to find out more about their trash. The cost of waste management had risen from $12,000 to $30,000 a year. Large additional increases were projected for the future.

Morton's city council recognized that a high percentage of the city's garbage would have to be diverted from the landfill in order to cut costs. A study of the city's trash was conducted immediately to find out what might be removed. Garbage trucks were weighed periodically after completing their collection routes to estimate the annual amount of garbage transported to the county landfill. Local leaders were not only able to estimate the weight but also the amount of specific materials in Morton's garbage by using percentage figures for paper, food, metal, and other items gathered in a recent state study of municipal waste composition. It was determined that food and yard waste made up approximately 35 percent of the city's annual waste stream. Removal of this refuse would reduce disposal costs by a third, saving the city $10,000 the first year. The city then hired an Oregon-based environmental consultant to help them determine the best method for recycling the food and yard waste.

Among the options considered by the city council was a community composting project which involved the collection of yard waste (leaves, grass, cuttings) and a unique collection and composting process for food and organic waste. Morton's wastewater treatment plant had operated at less than maximum capacity since its construction in 1976 and would easily be able to handle the additional loading if all food waste that was currently collected as trash was ground up using home garbage disposals.

Local leaders were most enthusiastic about an innovative technique in which the food-enhanced sludge from the wastewater treatment plant could be composted in existing drying beds after being mixed with grass, leaves and sawdust collected from the community. The unique ingredient in the whole process was worms. The end product, after specially bred worms digested the sludge and compost mixture, was worm castings or the best quality top soil money can buy. Even before bringing this idea to the residents of Morton, the city council knew through

Chart 2
Products discarded into the municipal waste stream
(in percent of total discards)*

Product	1986	est. 1995
Durable goods		
Major appliances	1.8	1.8
Furniture and furnishings	4.5	4.5
Rubber tires	1.2	1.1
Miscellaneous durables	6.0	6.4
Total durables	**13.6**	**13.7**
Nondurable goods		
Newspapers	6.3	6.4
Books and magazines	3.1	3.4
Office paper	3.6	4.0
Commercial printing	2.3	2.4
Tissue paper and towels	2.1	2.1
Other nonpackaging paper	3.8	3.9
Clothing and footwear	2.1	1.7
Other miscellaneous nondurables	2.0	2.1
Total nondurables	**25.1**	**25.8**
Containers and packaging		
Glass		
Beer and soft drink bottles	3.2	3.0
Wine and liquor bottles	1.5	1.5
Food and other bottles and jars	2.9	3.1
Total glass	7.6	7.5
Steel		
Beer and soft drink cans	0.1	0.1
Food and other cans	1.7	1.5
Other steel packaging	0.1	0.1
Total steel	1.9	1.7
Aluminum	1986	1995
Beer and soft drink cans	0.5	0.5
Other cans	0.0	0.0
Foil and closures	0.2	0.3
Total aluminum	0.7	0.7
Paper and paperboard		
Corrugated boxes	8.1	8.4
Other paperboard	3.6	3.3
Paper packaging	2.8	3.2
Total paper	14.5	14.8
Plastics		
Plastic containers	2.0	1.9
Other packaging	2.0	2.1
Total plastics	4.0	4.2
Wood packaging	1.5	1.3
Other miscellaneous packaging	0.1	0.1
Total containers and packaging	**30.3**	**30.5**
Other wastes		
Food waste	8.9	8.4
Yard waste	20.1	19.8
Miscellaneous inorganic waste	1.8	1.9
Total other wastes	**30.8**	**30.1**
Total wastes discarded	100.0	100.0

*totals may not add up due to rounding.

Source: Franklin Associates

the consulting firm that a ready market existed for the fertilizer product among the area's public parks, national forests and tree and bulb nurseries.

In September 1987, an advisory questionnaire was sent to all utility users in Morton asking which of four waste reduction options they would support. Procedures, costs and savings for each were carefully documented.

Although the food composting option involved the purchase and installation of garbage disposals by individual home owners, nearly 80 percent of Morton's households responded positively to "vermi composting" as the waste to organic fertilizer process is known. High grade disposals were offered to residents at the subsidized price of $30 each. Participation is now 100 percent among Morton's 400 or so households. Mayor Carroll La Gra, who spearheaded the effort, said people participate because it's convenient ("you recycle at your kitchen sink,") and because it saves tax dollars. Red McClarran, the environmental consultant who developed the vermiculture technology, believes that the process has great appeal because it's so natural: "We're just taking nature and adding management to it... we've taken a liability and converted it into an asset by putting these critters all in harmony in the sewer sludge and in the sawdust

and in the tree bark and the grass clippings and so forth."

While Morton's leaders may have developed a particular solution to part of the city's solid waste problem, their approach to identifying the composition of their waste stream can be used as a model:

- Identify the current solid waste problem and the financial and environmental issues involved;
- Assess the composition of current community waste and what might be removed;
- Identify markets for potential recycled products;
- Examine various alternatives for collecting and processing recyclable materials and the costs involved; and
- Involve the public in deciding what they are willing to support.

a local approach

While the most accessible data on waste composition is available from federal, state or regional sources, local leadrs may wish to confirm the accuracy of these figures for their community. The major requirements are time and some dedicated and conscientious citizens.

In analyzing any community's waste stream, local officials must realize that the amount of waste and percentage of various materials vary by season, by family size, age, and income and by location (single family home, farm, business or apartment). The following steps offer some suggestions that any community can follow:

- A representative group of volunteer households and businesses must be selected to participate in the waste composition study. In makeup, the group should represent a cross section of the community and be large enough in number to yield reliable results.
- The group must separate and weigh with great accuracy products or materials that the community may wish to recycle. To keep matters simple, the survey might focus on two or three easily separated items (paper, aluminum cans and yard waste, for example).
- Separation and weighing procedures should be conducted over a period of time (not necessarily every week) to account for seasonal changes.

Publicizing the results and the participants could help generate understanding and support for a future, full scale program.

the landfill and beyond

The final step in identification of the problem is to develop a basis for comparison between current disposal methods and other alternatives. For example, what are the true costs and benefits of landfilling, often "the only game in town," as a current method of solid waste disposal.

Until recently, local governments had few incentives to look beyond landfills as the final repository for most municipal garbage. Collection and disposal were relatively simple and inexpensive, and residents were not "burdened" with the separation of designated materials.

But solid waste problems caused by one disposal method may be substantially eliminated by switching to another. Tires, which cause multiple health and environmental problems in landfills, have been shredded for use in paving and recreational surface materials. Grass, leaves and other yard waste have been collected separately for use as revenue producing mulch or, space permitting, composted along with other organic wastes at residential sites.

The decision to recycle certain products is far from automatic, however, and its costs and benefits (involving collection, processing, marketing and managing) must be rigorously examined. In many cases the initial cost to recycle may exceed the current cost of landfilling the same products. Part of the difference can be accounted for by the start-up costs involved in recycling programs and the artificially low costs of older, environmentally unprotected disposal sites.

While waste management decisions usually involve more than dollars, landfilling will enjoy an unfair advantage when alternatives are considered unless its true costs and benefits are known as well. A profile of the local or regional landfill might begin with questions on cost and availability:

- How many years of useful life remain in the community's current landfill? Is this figure expected to change with anticipated growth in population or business activity?
- What has been the average increase in disposal costs (tipping fees per ton) over the last three years? Are major short term increases expected?
- Are any currently accepted products (tires, household hazardous waste, etc.) to be banned in the future?
- What are the projected costs for taking the old landfill out of service and developing a new site?

It is critical to capture the total costs of landfilling when it is compared to new or underutilized alternatives. Tipping fees at municipal facilities often cover only current operation and maintenance costs. The expenses associated with insurance, collection, transportation and equipment may be subsidized in other municipal budget categories. Recycling, on the other hand, has a positive effect on landfill costs (lower tipping fees, extended landfill life, removal of health hazards), and these savings should be entered on the balance sheet in favor of the alternatives.

Historically, landfilling has been the method of choice because it was the least expensive and least intrusive. In many cases, the current financial costs have been understated, future costs underestimated and environmental costs ignored. A systematic examination of the problem may provide both financial and environmental incentives to change the way that trash has always been handled.

Cost comparisons between existing and proposed

waste management options should specify figures in these important categories:

- capital and/or start-up costs (including site, building and equipment costs);
- annual operating costs (including tax revenues, grants, service fees);
- annual revenues (including tax revenues, grants, service fees);
- in-kind contributions (donated equipment, collection sites, and volunteer labor). These figures should be compiled for the useful life of the landfill and for the proposed alternatives. It is only by comparing the life cycle costs rather than those of just one year that the long-term costs and benefits can be examined.

The calculations suggested here must be done on a case-by-case basis, and the development of a community-specific analysis involves many variables beyond the usual worksheet or checklist approach. Local trash collection agencies, private haulers, public works departments, local finance officers, and a municipality's auditing firm can be useful in breaking out current collection and disposal costs. EPA and state recycling agencies may provide cost data on waste disposal alternatives, such as recycling and composting.

The findings in EPA's recent report to the U.S. Congress on current waste management practices are of particular importance to small governments considering landfill alternatives.

Although it is difficult to generalize across communities with widely differing waste problems, demographics, and economies, it is clear that true costs do not consistently guide the pricing of landfilling. Therefore, the allocation of resources to various waste management options is skewed in favor of landfilling. For most of the operating municipal solid waste landfills:

- True cost exceeds reported cost by a factor of almost three. This is the case for over 90 percent of the landfills that handle less than 560 tons per day.
- Tipping fees do not cover even reported costs for landfills smaller than 50 tons per day (about two-thirds of the landfills).
- Taxes, not user charges, provide most of the revenue at most landfills.

Most waste, however, is managed in larger landfill facilities. Nearly 60 percent of the waste is handled at only 6 percent of the landfills. At these units tipping fees are more likely to cover true costs and provide the majority of the revenue.

These aggregate estimates from survey data indicate that landfilling appears to be less expensive to many communities and citizens than it really is. If the true costs of landfilling are recognized and passed on to the users, shifts to alternatives might become more appealing.

Landfills are the final resting place for most of the trash or solid waste that Americans throw away. But even if landfill space is plentiful and disposal costs are reasonable, recycling has great potential to protect the environment.

potential threats in our landfills

While many waste products have value after their initial use, others simply come back from their landfill grave to haunt us. Solid waste planners must be aware of the potential threats listed below that commonly discarded items can cause once they are deposited in unprotected or inadequately monitored sites.

Tires - Americans throw away or trade in over 140 million tires per year. Many end up in landfills where they breed insects and disease when water is trapped inside the casings or they may bring harmful waste to the surface because of their tendency to rise or "float" to the top over time.

White goods - This term is applied to bulky household appliances such as stoves, refrigerators, air conditioners and so on. Many older appliances include parts containing polychlorinated biphenyls (PCBs), a toxic waste. More and more landfills are refusing to accept white goods which have not had PCB elements removed.

Plastics - Fast food containers, foam packing, plastic shopping bags, soft drink and milk containers now make up between 5 to 7 percent of the total national solid waste. Unlike yard waste and paper, two other high percentage materials, plastic does not decompose. Various plastics are estimated to last 50 to 500 years in typical landfill conditions.

Household hazardous waste (HHW) - While small in percentage, HHW poses major threats to soil and water at landfills and to both the air and the hazardous content of incinerator ash when burned. Many household cleaners, solvents and polishes are toxic in themselves or when mixed indiscriminately with each other in the disposal process.

Pesticide containers - Both the containers and the residual pesticides pose major environmental problems. They are of particular concern in farming and orchard areas.

Automotive batteries - Improper disposal of car batteries can cause lead contaminated sulfuric acid to enter the groundwater.

Household batteries - Widely used in toys, tools, flashlights, radios and smoke alarms, this class of batteries poses environmental problems whether landfilled or incinerated. The toxic metals that batteries may contain include mercury, nickel, cadmium, silver oxide and lithium.

Household paints - The average household has 10 cans of partially used paint stored at any one time. Much of it finds its way to landfills where oil based paints pose a threat as both a fire hazard and a source of toxic metals. Latex paint can cause elevated mercury levels in groundwater, and is a major problem for wastewater treatment plants when poured down a drain.

Many of these items are no longer accepted at landfills which lack facilities for hazardous waste. Both public concern and industry awareness has led to hundreds of successful programs across the country

in which the valuable materials from these products are reused, recycled, or reclaimed:

- Millions of tires each year are now being converted to energy in environmentally safe resource recovery facilities.
- White goods are prepared for reuse or scrap material. In Minnesota, the Twin Cities Used Appliance Company handles 30,000 to 40,000 appliances annually for refurbishment, resale or processing for scrap.
- New uses for recycled plastics have created a growing secondary market. Biodegradable shopping bags and diapers are now available.
- Since 1981, more than 850 communities in 42 states have developed household hazardous waste collection programs. This kind of annual or quarterly effort may be used to initiate environmental awareness in a community.
- Many farmers, local governments and private firms are reusing pesticide containers to ease environmental problems and are saving packaging costs as well.
- Secondary markets exist for both automobile and household batteries, especially when lead, mercury and cadmium prices are up.
- Some recycling centers throughout the country have established product exchange or donation sites involving paints, furniture and other still usable products.

Some of the efforts are long-standing, some are small and experimental. In each case, success depended on matching the product with a new or renewed use.

Getting to know your trash involves studying the amount, the composition and the problems posed by individual products or materials. But the recent growth of recycling has shown that in many cases, familiarity breeds innovation, not contempt.

chapter 3

to market, to market

"We began recycling without firm commitments
from buyers and ended up with
a well-organized garbage dump."
-- local elected official

Unlike many other businesses, recycling depends largely on the demands of the market rather than the availability of the product. Before selecting any product for recycling, community leaders should answer these basic questions about local or regional recycling markets:

- What products are in demand?
- What specifications must recycled products meet?
- Who are potential purchasers and where are they located?
- How does a locality negotiate a fair and reliable contract?

The process of marketing a product, of course, involves far more than just finding a buyer. The goods to be recycled must be separated, collected, processed and transported to their final destination. Yet the best organized recycling program will not survive unless purchasers are found for recycled products. The recycling market is different from the familiar competitive marketplace of goods and services and, even those who have been successful in private business or public service must know the particular rules associated with recycling:

Recycling is market driven. Recycled products, for the most part, are competing with a well established supply of new or "virgin" materials: newsprint competes with pulp wood, scrap iron with iron ore. Manufacturers often do not take full advantage of available recycled materials which may require changes in processing and quality control and additional collection and transportation costs. Manufacturers often rely on single, or established sources for certain products and are reluctant to deal with new, unproven suppliers. Businesses also cite buyer resistance to products with recycled content as a barrier to greater demand for reclaimed materials. Recycled products experience some of the same discrimination as generic vitamins which a chemist can't distinguish from the name brand, but a significant number of buyers believe they can.

In many cases, new materials are less expensive to use than recycled goods. Two long-standing policies account, to some degree, for the differences in cost:

- tax incentives favor resource development over both recycling and reuse, and
- consumers (or local governments), not manufacturers, have had to pay the cost for disposal or reclamation of a product once its original purpose has been fulfilled.

Recycled goods are not a "raw material" but a product which must meet specific requirements. Recycling is not complete until the reclaimed material is actually used in the manufacturing of a new product. Widely accepted industry specifications exist for all commonly recycled materials, and locally separated goods are virtually unmarketable unless these requirements are met. For example, newsprint and higher grades of paper should not be mixed, and glass bottles should be free of caps and collars and separated by color.

Photo by Maguire-Reeder, Ltd.

New markets are opening up for previously unrecycled materials. Plastic beverage containers can be shredded for use in a variety of products, including parking barriers, outdoor picnic tables, and building materials.

The delivery of a product from the consumer who disposed of it to the manufacturer who will use it again involves separation, collection, processing and delivery. While every step is essential, processing guarantees that the delivered product will be acceptable to the market. The ability to attract fair, and even competitive, bids depends on a recycler's track record in meeting and maintaining market specifications.

Prices fluctuate widely. Market prices for recycled materials, while differing from product to product, are consistent in their broad and rapid fluctuations. Recently, corrugated paper board went through a price cycle of $20 a ton at its low point and $110 a ton at its peak. The offered price reacts sharply to such factors as the supply of virgin materials, a surplus of recycled materials, downturns in the national and international economy. The local recycler has the difficult task of balancing price and demand instability with a steady stream of waste materials for which both a market and some income must be found.

Local recycling is conducted for public service, not profit. While exceptions exist, local governments generally do not make a profit on recycling operations. Recycling is prompted most often because of concerns over current and future landfill space and environmental hazards. The service versus the profit motive is a critical distinction to keep in mind when weighing the cost and benefits of recycling versus landfilling. Just as tipping fees do not pay for the total cost and long-term impact of landfills, market income should not be the only measure of recycling feasibility. Above the local level, however, intermediate purchasers such as private haulers and regional processing facilities often do operate on a for-profit basis.

Reliable quantities of recycled goods may create new markets. While markets for recycled products are critical, their distance, or even their absence, should not discourage a community from exploring waste management alternatives. Active recycling markets exist in many areas for these commonly recovered solid waste materials: various grades of waste paper, ferrous metals, aluminum, such as cans; glass containers, plastics, such as milk bottle or PET (polyethylene terophthetate) soft drink containers; leaves and/or grass clippings for compost, tires for retreading or energy recovery, lead acid batteries, and used oil.

New or expanded markets often open up when localities can guarantee significant quantities of specific products through cooperation or regional collection. Many localities have initiated recycling for a single, much-in-demand product before establishing a more ambitious program.

marketing products cooperatively

In order to negotiate long-term contracts with manufacturers, Peterborough, N. H., helped establish a marketing cooperative that collects recycled products from 65 other towns in the state. The ability to guarantee quantity and quality were the keys to developing these new or expanded markets. John Isham, Peterborough's town administrator, said the search for markets has changed in a relatively short time: "The technology to recycle many materials already exists. It has taken a dependable public supply to convince industry to tool up to handle recyclables. Markets are much more publicized than when Peterborough started out; we used to have to shake buyers out of the woodwork." Isham offers the following recommendations for locating or developing markets:

- **Check the want ads** in journals such as *Waste Age* and *Resource Recovery*. (See appendix c.) These publications have listings from national and regional recyclers for numerous products. Check the local Yellow Pages under product or material type (metals, plastic, glass, paper), and check the telephone book white pages for companies known to use or manufacture these products.
- **Obtain state or regional recycling directories** from state agencies or industry associations. (See appendices a and b.)
- **Use word of mouth recommendations.** Buyers who handle one form of plastic or paper, for instance, are often aware of markets for related products. There is a long established network of private scrap dealers

and processors from which current municipal recyclers can benefit greatly.

• **Provide on-the-job training for recycling staff.** Isham suggests contracting with a successful recycling director from a nearby community to help set up a new program. Another approach is to send local recycling staff to work for a week or two with an established municipal program or private recycling company.

• **Join or initiate a cooperative marketing organization** if local volume is insufficient to interest buyers. The central collection of recycled materials from a number of communities promotes markets in several ways: quantity is critical in negotiating long-term contracts and in gaining industry's commitment to using recycled goods in the first place; the volume of material handled at local recycling centers often leads to savings for local governments in transportation, equipment, and site development; and some industry buyers have provided storage containers and pickup service when specified collection levels are maintained. A number of states are establishing regional processing centers to promote cooperative marketing. Local government leaders should contact the state recycling agency to learn about state initiatives or about regional private or non-profit collection centers which are already in operation. Private haulers are often willing to serve a regional role, particularly for products which are in consistent demand. In other instances, a single community, such as Peterborough, has approached smaller neighboring towns to institute a collective effort. Experience indicates that cooperative marketing helps create markets, not depress them.

Recycling, then, is like most businesses in that products are provided for the marketplace. Market decisions, however, are influenced by the distinctions we have noted for recycled goods in terms of product demand and availability, specifications, price fluctuation and the service, rather than profit, motive.

in search of markets

Prerequisites for locating recycling markets include information on the quantity and quality of recycled products that a town can offer and an understanding of how the market for these materials operates. The search for markets by local officials may be conducted by contacting local manufacturers, using the "Yellow Pages," or consulting one of many available recycling directories. Regardless of method, the key to making selective rather than random contacts is to know who buys what and why.

Paper. Waste paper is the mainstay of most recycling projects, and more than 22 million tons of various grades of paper are collected each year. This total represents about 28 percent of all the paper products that are actually produced.

Recycled paper is used primarily by mills that produce newsprint, stationery, towels, tissue, napkins, insulation, roofing paper, packaging and paper board. In addition to newsprint and corrugated boxes, there are numerous grades of paper for which premium prices are paid. Market specifications determine category, grade and allowable contamination from such materials as rubber bands, staples and below or above grade paper.

Local recyclers who collect separated paper products at curbside or at drop-off centers generally sell their wastepaper to dealers and processors. The dealer then grades and prepares a variety of paper products for shipment to manufacturers. On occasion, localities sell directly to paper mills if quantity and logistics allow.

While newspapers are highly visible, corrugated paper has traditionally accounted for more than 40 percent of all recycled paper products. Newsprint, mixed paper and high grade paper each comprise about 20 percent of the total remaining market. Potential buyers may be listed under "waste paper" or "recycling" in the Yellow Pages. Since processing and distribution are often handled on a regional basis, nearby metropolitan areas should be surveyed as well.

Waste paper is the biggest, as well as the most volatile, of the recycling markets. It is negatively influenced, for example, by declines in sales of foreign products in this country, particularly those coming from Japan. Japan buys waste paper from the United States and converts it into boxes for shipping products back into the country. Sales also are negatively influenced by declines in the domestic housing industry which uses paper derivatives, such as wall board, insulation and roofing materials.

On the positive side, there are now approximately 2,000 waste paper dealers in the United States, and many civic or non-profit organizations are currently collecting papers for their own benefit in situations which might not be financially feasible for localities or private haulers.

Glass. Approximately 5 billion glass bottles and jars are recycled each year, principally as raw material for new glass containers. Glass is used increasingly in the manufacture of fiberglass, asphalt, brick and outdoor surfacing products. The principal markets for recycled glass are the 86 major glass container manufacturers in the United States which rely partially on recycled bottles and jars to make new products. But the number of secondary recycling processors and brokers has expanded dramatically as glass recycling has grown nearly five-fold in the last 10 years. Environmental awareness, industry initiatives, bottle deposit bills and new uses for glass have all contributed to this growth of outlets.

Recycled glass generally must be separated into three categories: clear (or flint), green and amber. Rings and caps which melt below the temperature at which glass liquifies must be removed at the collection or processing stage. Metal of any kind can cause either structural problems for the new glass or damage to furnace linings.

Glass may be transported to market as either whole containers or in crushed (cullet) form. While whole containers bring a higher price, glass as a category is

both heavy and has relatively low market value. Transportation costs are critical in judging which market to use and whether glass recycling is financially feasible in your community.

Aluminum. Aluminum is the one recycled product for which a substantial and even profitable market exists. In many communities, aluminum is already collected by individuals, churches, clubs, or for-profit haulers. While representing less than 1 percent (by weight) of the total national waste stream, more than half the cans discarded each year are recycled. A 75 percent recycling level is projected by the 1990s. Although prices fluctuate, aluminum may bring 10 to 20 times more income than a comparable weight of glass or paper. For industry, recycled aluminum saves 95 percent of the energy required to refine raw materials. For collectors and processors, aluminum is easy to collect, sort, prepare for market and crush for shipping.

Secondary processors or brokers for aluminum are now common and may be located through the Yellow Pages or the state waste management agency.

Tin cans/ferrous metals. Most residential recycling of iron and steel products (ferrous metals) focuses on the recovery of "tin" cans. Tin cans are actually 99 percent steel in composition and 1 percent tin as a protective coating. The final market for most recovered iron and steel products are the 5,000 foundries nationwide, which use about 25 percent "scrap" steel from outside sources in the manufacture of new products.

The recycling of tin cans, or more correctly, of ferrous metal cans, may involve fairly complicated market specifications. Recyclers or brokers of steel products are concerned with the total yield of ferrous metal and penalize a supplier whose goods contain organics, contaminants or rust.

Other industries are interested in reclaiming the tin, lead, aluminum or copper which may be plated, attached or alloyed to the ferrous metal. Again, for these markets, yield is the critical measure.

Local governments should carefully research the long-term and short-term demand for products derived from tin cans and understand the penalties as well as the rewards imposed by market specifications. Local markets may be found in the telephone directory under, "Scrap," "Junk Dealers" and "Recycling."

Plastics. In 25 years, plastics have grown from less than one-tenth of 1 percent of the waste stream to more than 5 percent by many recent estimates. While consumers seem to welcome light, non-breakable bottles, disposable packaging and plastic wrapped foods, the types and quantity of plastic in use have caused grave environmental concerns. Many plastics do not decompose for years or even centuries; the multitude of plastics and mixed plastic containers make separation nearly impossible; and even when separated, the reuses for plastic, until recently, have been extremely limited.

There have been encouraging developments in all three areas. Biodegradable plastic shopping bags and diapers have been introduced. Industry is developing a coding system for plastic containers to facilitate sorting and containers made from different types of plastics are being eliminated. Most importantly, new uses for the two major types of plastic beverage containers are becoming commercially successful.

Plastic recycling focuses on large clear soft drink

Buyers of recycled materials look for reliable quality and quantity before signing long-term contracts. Small communities often market their products cooperatively in order to meet these industry requirements.

Photo by Maguire-Reeder, Ltd.

bottles (now 80 percent of the one liter bottle industry) and the heavier plastic milk bottles.

Recycled PET soft drink bottles can be used as fiber-fill in pillows, jackets, sleeping bags and automobile seats. Other uses include insulation, shower stalls, floor tiles, automobile bumpers, tail light lenses and power tool housings. This diverse and extensive list suggests the range of local and national companies which may be interested in recycled plastic.

Gallon and half-gallon plastic bottles made of high density polyethylene now dominate the milk and fresh juice industries. The long life of this plastic, which plagues landfills, has become a virtue when made into new plastic products. A growing number of companies is manufacturing outdoor recreation equipment, fencing, boat piers and docks, flower pots, underground pipe and traffic barriers from this once unrecyclable product. A Northeastern town reports that high density plastic has increased five fold in price in the space of two years.

State waste management agencies may be the best source of information on these fast developing markets and technologies involving plastics. Emerging industries themselves may contact a locality or landfill about separating plastics for reuse.

Automobile tires. Of all the tires discarded annually in the United States, less than 20 percent are reused. Until recently, retreading of salvageable casings was the major reuse for tires, and the selection had already been carried out by dealers before the remainder were landfilled or abandoned.

Several waste-to-energy facilities on the East and West coast now rely entirely on used tires for fuel while meeting stringent environmental emissions standards. Other incineration plants which produce energy use a percentage of shredded tires. Recently, all weather surfaces for track and field and other sports facilities have used compositions made, in part, with finely ground tires.

In areas where markets do not exist, some landfills insist that tires be shredded to eliminate some of the environmental hazards posed by whole tires.

Localities should work with tire wholesalers and retailers to assure that the maximum number of tires is being recycled and that the remaining tires are disposed of properly by either shredding or grinding up. Area waste-to-energy facilities and paving and surfacing companies offer other potential markets.

Motor oil. Approximately 1.2 billion gallons of used oil are generated annually in the United States. Much of the industrial oil and some of the motor oil are recycled, primarily as fuel. About 400 million gallons, or one third of the total is dumped, causing pollution to harbors and waterways. The worst polluters are back-yard mechanics who dump used crankcase oil on the ground or in storm sewers or drains leading to wastewater treatment facilities. Motor oil is the largest single source of pollution to streams and rivers and is a particular threat in rural ground water.

Used oil is valuable as both reprocessed oil (a fuel) and as re-refined oil which is identical to commercial motor oil. A number of states require that service stations accept used oil from local residents. Localities should determine what recycling opportunities are currently offered and work with local retailers and perhaps regional refiners to encourage maximum reuse.

The appendices to this guidebook list state solid waste management agencies and national associations for each major recycled product. Both may be important sources for locating markets. A number of state agencies, for instance, periodically issue comprehensive state or regional directories of recycling markets.

marketing arrangements

When one or more markets has been located for each recycled product, a locality must decide between negotiating a contract sales agreement or selling on the open market. Both arrangements have advantages and disadvantages.

The open market. In times of demand and in areas where multiple markets exist, the open, or competitive, market may yield substantially higher returns than when products are sold through fixed prices under contract. The potential for higher returns must be balanced with the lack of guaranteed prices or the risk of no demand at all in times of market weakness. Trading on the open market requires a knowledge of past and present market conditions and the time to research and negotiate within a world of ever-changing options. As a rule, facilities which use the open market share two characteristics: adequate storage space and enough money to hold on to products until the market price is advantageous.

Contract sales. Most localities are more concerned with keeping waste out of landfills than with generating maximum income. In general, they have little storage space and little time and expertise to "play the market." While contracts often favor industries or processors in terms of the price paid, they also guarantee that recycled goods will continue to have an outlet despite weaknesses in the overall market. In short, a reliable contract shields your community from dealing with a well-organized garbage dump.

Contract prices may be set using one of three arrangements:

1. Fixed price - Usually short-term, fixed price contracts establish a set price between buyer and seller, along with other contract obligations.

2. Floating price - These contracts provide some measure of protection for both buyer and seller by tying the product price to a percentage of a mutually recognized market quotation.

3. Floor/escalator price - This contract arrangement is similar to the floating contract, except it offers the protection of a minimum price to the seller, as well as price increases tied to a growth in market demand.

Contracts cover a full range of conditions which obligate both the buyer and the seller. The Vermont

State Directory of Markets for Recycled Materials recommends that the following provisions be considered for inclusion in a market contract:

a) Description of material type(s) and grade(s),

b) Delivery arrangements, including size (minimum or maximum tonnages) and frequency of shipments,

c) Materials specifications guidelines, including acceptable contamination levels and form required,

d) Duration of the contract,

e) Non-performance penalties (if program fails to deliver tonnage or quality promised in the contract; this is to the buyers advantage),

f) Price-setting mechanism,

g) Services to be provided by the market (transportation, storage),

h) Any special terms and conditions.

After prospective markets are identified, the next step, if available, is to secure a firm commitment from each market in the form of either a letter of intent, a letter of agreement, a contract or a purchase order. Be sure to shop around for the most favorable contractual arrangements.

public markets for recycled goods

Recycling markets will grow only through increased demand. Local officials are often dismayed that municipal involvement in recycling is on the supply side, not the demand side, where major action is needed. The potential demand of combined government spending at all levels, however, is enormous. Federal, state and local budgets represent more than 20 percent of the Gross National Product of the U.S. and pioneering state and local policies have been responsible for some significant growth in recycling markets.

Local governments have used the following methods to establish themselves as "living examples" of the community's commitment to recycling and overall waste reduction:

- separate and collect different grades of recyclable paper at city or town hall and in all public buildings (including schools);
- purchase recycled paper when possible and increase the target percentage over a period of years;
- purchase recyclable products;
- purchase products with a long useful life and/or with replaceable parts;
- purchase products in reusable containers and in bulk, not individual packages;
- encourage local businesses to adopt a recycling/reduction perspective in conducting business;
- establish public education and outreach programs to encourage overall waste management among school age children and adults.

chapter 4

designing a recycling program

"Peterborough started into recycling in 1980 with a mandatory ordinance passed at the town meeting. The reason behind the ordinance was the high cost of solid waste disposal... We decided there had to be a better way of doing business."
-- John Isham, town administrator, Peterborough, N.H.

Recycling is a better way of doing business, but there is no one way—one right way—to do recycling.

Recycling's promoter may be the town, township, city, village, county, private hauler or a non-profit charitable organization. Collection may be curbside or through several community drop-off centers. Local or state government may encourage voluntary recycling or mandate source separation by households and businesses. The options, and combinations of options, are many.

Your community's particular needs and resources should determine how recyclables are collected, handled, and transported to market. The question your community must keep in mind is: **what is the most effective and the most affordable way to make recycling happen in our town?**

Efficacy is sometimes measured by monthly household participation rates, which range nationally from 10 to 90 percent. A voluntary recycling program is considered highly effective if 75 percent of all households participate by putting their recyclables at curbside or depositing them in drop-off containers.

But participation rates are deceptive. They do not reflect the total amount of waste diverted from the community's waste stream. A better measurement of efficacy is the percent of all trash that is diverted from the incinerator or landfill and turned into recyclables. Your goal is to reduce through recycling about 25 percent or so of trash that would otherwise end up in the landfill.

Effective programs must also be affordable. Land, buildings, equipment, staff and promotional expenses are among the capital and operating costs of a recycling program. Because many of these expenses can be shared, some recycling activities are best conducted on a regional or partnership basis.

The cost of recycling almost always exceeds the revenues earned from the sale of recyclables. But a combination of revenues and avoided costs — lower collection costs, reduced tipping and transportation fees — usually equals, or exceeds, the cost of running a recycling effort, especially when projections of future landfill costs are considered.

follow the leader

Who should lead your community into recycling? This question may be answered in part by proposing other questions:

- Who is currently responsible for local solid waste management—government, a private hauler, individual households?
- Is the state mandating recycling and assigning coordination responsibilities to a particular level of government?

It is logical to tie the responsibility for recycling to the government, private hauler or individual household which currently provides and finances trash collection and disposal. Packaging these services

together internalizes all solid waste management costs, and the benefits of recycling—avoided costs and revenue from the sale of recyclables—are clear and direct.

The different units of local government involved in solid waste functions may make it cumbersome to pull recycling responsibilities under one roof. For example, cities or towns might collect trash, while counties operate disposal sites. But recycling can proceed, through cooperative city-town-county projects or adjustments to state law.

As concern for landfill space and costs has grown, states are increasingly mandating some type of community recycling effort. Connecticut, Florida, Maryland, New Jersey, New York, Oregon, Pennsylvania and Rhode Island are now requiring recycling, and other states are quickly following suit.

The question of who should lead community recycling is often answered by these state initiatives. Pennsylvania, for example is requiring counties to design solid waste management plans, but townships and cities are designated as the coordinators of community recycling.

The government as leader --Studies have shown that recycling has the greatest impact when treated as "just another public service." If the local unit of government is providing trash collection and/or disposal as a public service, recycling should be placed in the same category.

Sullivan Township, Ohio, a rural community of 1,300 residents, provides households monthly curbside trash pickup for a fee of $12 per year. Starting in November 1987, Sullivan added recycling to its list of public services.

Each month, the township trash truck, pulling a trailer donated by a local citizen, travels the township's 25 square miles to collect newspapers, cardboard, three types of glass and plastics. Using the two vehicles in this way, recycling becomes a normal extension of the township's trash hauling service.

The recycling program, however, does what any public service, such as water, sewer, or trash hauling, should do. According to township official Mike Canfield, the monthly revenue from selling recyclables to the Ashland (County) Recycling Center covers landfill tipping fees, upkeep on the pickup trailer and expenses involved in educating the public to the benefits of recycling.

Some local governments, however, may elect to contract with a private hauler for trash pickup. Such contracts can be set up in one of two ways: the local government pays the contractor, then bills the household either as part of another utility bill or separately; or the local government requires the contractor to bill individual households. In either case, the government and the people it serves can benefit from recycling by getting a reduced pickup charge that reflects how much the hauler is saving in tipping fees or earning from collected recyclables.

The local government can spell out in its contract with the hauler what items are to be picked up for recycling, how and when pickup is to be made, penalties that can be assessed for not recycling, and what benefits from recycling should come back to the community.

In East Buffalo Township, Pa., a private hauler collects aluminum, glass, newsprint, two-liter plastic bottles, and motor oil at curbside on the first Saturday of every month. At all other times, residents may deposit recyclables in drop-off boxes near the municipal building. The hauler collects all recyclables, from curbside and drop-off stations, at no cost to the township and retains recycling profits to cover the cost of collection.

Newberg Garbage Service, Inc., which has the city contract to pick up trash in Newberg, Ore., a community of 11,000 residents, operates a successful and highly motivated recycling program. Households are offered free curbside pickup of recyclables on the first Friday of each month. Newspaper, cardboard, glass bottles and jars, food cans, aluminum, and used motor oil may also be deposited at nearly a dozen conveniently located drop-off centers throughout the community.

The private hauler as leader --Recycling programs by private haulers are most likely to occur in states where some recycling is mandatory and where local governments are not involved in trash pickup.

Having a recycling program, however, may help a private hauler get a contract with some town or city to provide full pickup service.

Private haulers, who bear all the expense, will also reap all the rewards of recycling unless individuals or a local group encourage the hauler to offer incentives to local residents, such as reduced fees. Without local government intervention, individual households will have to negotiate their own terms with haulers.

The individual as leader -- In communities where waste collection and disposal is the responsibility of individual households, recycling is still possible. It just takes a different course.

Residents who choose to haul their own trash may separate recyclables and deposit them in drop-off boxes, often stationed at the landfill. Or there may be other recycling drop-off sites in the community where the individual can take items such as glass, aluminum, and paper.

Separating recyclables avoids disposal costs and may even put a few dollars into the household spending budget, if the drop-off center operates on a buy-back or redemption basis.

Non-profit organizations as leader -- Local non-profit organizations that are environmentally conscious and/or have fundraising motives are popular recycling leaders. Many environmental or litter control groups have proved their eligibility for non-profit status through work in solid waste and environmental education. An organization that meets Internal Revenue Service criteria for non-profit status

is exempt from certain federal income taxes and may receive monetary contributions and other donations—recyclables, for example—that are tax deductible for donors.

Glass recycling in Hopkinsville, Ky., for example, began as a result of the work of Pride, Inc., a local non-profit community improvement organization affiliated with Keep America Beautiful. Pride, Inc., through the City of Hopkinsville, sought and received a $35,000 grant from the Tennessee Valley Authority to equip a glass redemption and crushing operation at Trace Industries, a sheltered workshop for developmentally disabled adults. The result is a recycling program that has reduced landfill deposits. In addition, the program pays wages to handicapped workers who crush the glass, while putting a large dent in the city's litter problem.

Trace Industries maintains a staff that will help people who bring in glass for recycling. But even more common among non-profit groups are unattended recycling drop-off centers. Social service organizations such as Lions, Kiwanis and the Boys Scouts often favor unattended centers with minimal management requirements and costs.

Participation in drop-off centers is sometimes strongly tied to the spirit of charitable causes. More residents are likely to contribute recyclables if the center is sponsored by or donates its proceeds to an organization that does good for the community.

Sometimes not one, but several community leaders encourage recycling. Building partnerships among local government, private haulers, environmental and community improvements organizations and concerned individuals is an effective means to parcel out recycling management and public education tasks.

No matter who performs the mechanics of recycling, someone or some group has to get the community motivated, enthused, committed. And, the person or entity who initially inspires the community to act may not be the ultimate provider of recycling services.

collection techniques

Deciding on the right method of collection is a big challenge to any recycling program. What is the best way to gather the greatest quantity of newspapers, cardboard, glass, aluminum, motor oil and yard waste? Quantity is critical since the goal of recycling is not only to achieve high participation rates but, more importantly, to divert as much trash as possible from landfills and incinerators.

Effective collection is a function of two factors: convenience for the waste generator and efficiency for the waste handler. **Doomed to failure are collection techniques which require too much effort and thought on the part of residents or excessive work and expense on the part of haulers.**

Recycling is most apt to be successful if the method of collecting recyclables mirrors the method of trash collection. If trash is collected curbside, collect recyclables curbside; if residents haul their own trash, offer convenient drop-off centers. Why mirror methods? Because what works best is what's most simple. Simple containers and schedules for curbside pickup, simple rules for dropping off recyclables.

Some activities of recycling, such as marketing and processing, are suitable to regional approaches. But collection is best performed at the most local level. The Minnesota Project, a non-profit rural community development organization, recommends that collection occur at the level of government residents think of as "community" which, coincidentally, is often the

Recycled goods are not a "new material" but a product which must meet accepted industry specifications. Glass bottles, for instance, should be free of caps and collars and separated by color.

Photo by Maguire-Reeder, Ltd.

level at which trash is collected.

Drop-off programs -- Although curbside collection is becoming increasingly popular, drop-off programs remain the most common means of collecting recyclables. In 1987, the Pennsylvania Department of Environmental Resources counted 91 curbside and 350 drop-off programs in that state.

The term "drop-off" means that residents transport and deposit their recyclables in containers of some type. Programs range from one drop-off box stationed at one site to many drop-off centers or depots, collecting a range of recyclables, in several locations throughout the community.

A common misconception about drop-off programs is that they are inconvenient and, therefore, do not attract a large quantity of recyclables. Drop-off operations perform very well, especially in sparsely populated communities where individual homeowners must haul their own trash.

Ingredients in the success of any drop-off program include location of collection sites, distance people have to travel to the sites, and how simple and appealing the process of dropping off recyclables is made. Easy and convenient access are the call words in drop-off station siting. Any community area or building where people frequently congregate, shop, visit, or drive by is suitable.

For example, a drop-off site in the town park will allow visitors to deposit soda cans in a recycling box just as easily as they could toss cans into the trash or onto the ground. Shopping centers are excellent drop-off sites because customers can bring newspapers, bottles, cans and jugs on their way into purchasing new products. The landfill is an appealing site because residents and businesses that haul their own trash may be motivated to reduce waste deposit fees by recycling.

Drop-off sites donated or loaned by local government, business or community groups save on capital outlays. Abandoned school buildings and yards, shopping center parking lots, vacant commercial storefronts, empty warehouses and lots, community college property, closed gas stations and church basements may be convenient and affordable locations.

The amount of space required for a drop-off operation depends upon the number and variety of recyclables collected and the activities to be performed at the location. Most drop-off sites are simply collection points for products; others are collection and processing centers, where recyclables are readied for transport to market.

Distance to drop-off sites is another influential factor. The farther people are required to travel, the less likely they are to recycle, according to the results of a 1986 study conducted by Tennessee Agricultural Economists Deborah Markely and William Park, of the University of Tennessee, of five Grainger County communities.

Drop-off operations should also be simple to follow and appealing. Attractive, clear signs instructing the public about what products to put where, and a clean, painted, fenced-in, well-lit, safe area are excellent advertisement for the center. An appealing site is suitable for field trips by school classes, church groups, scout troops and others, and can help to build community support for the recycling program. A telephone number or recording, offering simple instructions and hours of operation, is an additional asset.

Stations for collecting recyclables may be staffed, by paid or volunteer workers, or unattended. There are pluses and minuses to both arrangements.

At staffed centers, workers can educate the public and make certain that only recyclable materials are deposited. Staff salaries and related costs, such as insurance, are often unaffordable, but volunteers may not always be reliable.

Most unattended centers have the advantage of being accessible 24 hours a day with little or no labor costs. But vandalism is sometimes a problem. Containers must be sufficiently sturdy to withstand unattended use. Non-recyclables are often mingled with recyclables, and there is less opportunity to educate the public about recycling.

Curbside collection --Residents in even the smallest communities may be in the habit of taking trash to the curb if that is the method of trash collection already established. It's an easy addition to the habit to take out recyclables as well.

Proponents of curbside collection also contend that a kind of neighborly peer pressure educates citizens about recycling and encourages participation.

The term "curbside collection" means simply that residents place their recyclables at the curb. These programs vary considerably in terms of the extent of sorting required of residents, and the schedule and frequency of pickup.

Recycling experts disagree on the effect that separation requirements may have on compliance. Some say that residents should be able to co-mingle their recyclables because it minimizes effort and confusion. But if convenient containers are supplied, say the advocates for residential source separation, sorting is simple and far more efficient for the collector.

Also subject to debate is the issue of how often recyclables should be collected. In our example of Sullivan Township, Ohio, that community runs a successful monthly curbside collection program, but others argue that pickup should be more frequent to reduce storage time by residents.

No matter how materials are arranged or how often they are collected, recyclables should be picked up on the day trash is also collected. That collection should be regularly scheduled each month or week. A 1986 survey conducted by *Waste Age* magazine found that participation rates averaged 41 percent for separate day pick-ups and 76 percent when recyclables were collected on the same day as other trash. Simplicity encourages participation.

Source separation is facilitated by providing special bags, tags or containers for recyclables. Attractive, lightweight, stackable, color-coded containers—green for glass, blue for aluminum, for example—

Providing recyclers and potential recyclers with the necessary information assures that materials are delivered in the proper condition for sending to market. The opportunity to educate the public is a major advantage of having a staffed drop-off point for recyclables.

Photo by Maguire-Reeder, Ltd.

make it easy to separate, haul to curbside, collect and sort materials. Clear, versus colored, plastic bags make the process of checking for non-recyclables easier for the hauler. Tags tied on bags clearly mark and distinguish recyclables from trash.

"Blue boxes," which hold layers of newspapers at the bottom and paper bags of bottles and cans on the top, are gaining popularity. When a Midwestern city distributed blue boxes, the residential participation rate climbed from 20 to 80 percent, and then leveled off at 60 percent.

Fancy containers are not necessary, however. As noted earlier in this guidebook, Newberg Garbage Service Inc. provides used five gallon plastic ice cream buckets to customers.

Another low-cost strategy is to solicit local businesses for donations to purchase containers, and then to recognize their contributions with an imprint or sticker on the containers.

Because recyclables are valuable, many local governments pass anti-scavenging ordinances to discourage stealing of what is considered personal property. To prevent littering, towns and cities also dictate how long recyclables may sit at curbside before the scheduled day and hour of pickup.

Buy-back (redemption) operations-- A variation on the drop-off center approach is buy-back or redemption operations where contributors of recyclables receive cash or make donations to designated community organizations.

For some people, redemption is a strong incentive to recycle. Cash in hand makes it worth the trouble. Providing residents with an opportunity to buy-back on behalf of a community group, such as the Boy Scouts, engages these organizations in the mechanics of recycling.

Redemption may not be feasible for all recyclable materials. Some programs offer redemption for certain highly valuable products, such as aluminum, but not for less valuable products, such as newspaper. The market conditions present in your area will determine which, if any, recyclables can be handled on a buy-back arrangement.

While providing an incentive for recycling, redemption programs may also require more bookkeeping work and equipment—scales, calculators, cash registers, safes. In addition, trained staff, probably paid staff, are needed to handle financial transactions.

Commercial pickup -- Even in small, rural communities, commercial establishments may be major contributors to crowded landfills. Grocery stores, warehouses and manufacturing localities discard large quantities of corrugated paper. Restaurants, hospitals and school dining halls generate glass and plastic. Banks, insurance companies, law firms and print shops throw away reams of high grade paper. Scrap metal, motor oil, building materials and tires are tossed into the landfill by other businesses.

Pickup of recyclables at commercial establishments is the financial backbone of some recycling operations. Businesses can provide a steady, reliable flow of materials and income, whether the recyclables are collected on a regularly scheduled day or on a "you-call" basis.

Ordinarily, commercial collection is provided more frequently than residential collection. For example, in Sullivan Township household recyclables are picked up monthly, but commercial recyclables are collected

weekly. Even though the township is home to only a few non-residential establishments, commercial pickup uses the businesses' commitment to recycling to spread support throughout the community.

Collection techniques are not mutually exclusive. They can be combined and altered to appeal to as many people as possible.

Cities such as Arcata, Calif. (pop. 13,000) are discovering that a full menu of collection options draws in the most participants: buy-back, drop-off donation, small neighborhood depots and commercial pick-up. A greater percentage of trash will be diverted from the local waste stream when the collection program has something for everyone.

voluntary versus mandatory

Americans prefer free choice. But, as a society, we have chosen to set certain rules, or laws, which govern the will of people.

A controversial piece of recycling planning is the question of whether, and how, to require recycling. Should citizens be encouraged or required, by law, to recycle? If recycling is voluntary, what incentives will encourage participation? If recycling is mandatory, what enforcement penalties are appropriate?

Voluntary programs – Successful voluntary programs, which outnumber mandatory programs by a ratio of 3 to 1, encourage residents and businesses to choose recycling. Such programs are often spurred on by setting ambitious, but realistic, goals: "By the year 1990, through recycling, our town will reduce the amount of trash going into the landfill by 20, 25 or 30 percent."

Effective public education is one critical piece in the voluntary program puzzle. The other piece is to create incentives, especially incentives that hit people where it hurts: the pocketbook. A variable fee, tied to the volume of trash generated by residents, is a natural way to encourage recycling.

The Village of Illion, N. Y. (pop. 9,800) calls its innovative waste reduction program a "pay-as-you-go" system. For several years, and with little success, Illion officials promoted recycling but did not offer any special incentives. In June 1988, they changed course. Trash pickup was free to village residents. Village staff broke down the total cost to the village of curbside trash collection and instituted a new pick-up fee of $1.15 per 30 gallon trash bag and $.85 per 16 gallon bag. The village offered the clear plastic bags stamped with the village emblem, through local stores, to residents for $1.15 and $.85 each.

Now mixed garbage will only be collected if it is put at curbside in Illion's official bags. Separated, recyclable materials—corrugated cardboard, newsprint, clear glass and tin—are picked up at the curb in any type of bag at no charge.

During the first three months of the system, the volume of recyclables collected by Illion surpassed the amounts collected in all of the previous years. The residential participation rate is about 63 percent, the commercial rate is about 90 percent, and Illion's hauler is taking fewer trips to the landfill.

The Borough of High Bridge, N. J., (pop. 3,000), uses special stickers to urge recycling. At the start of each year, High Bridge residents are given an allotment of 52 stickers, one sticker to finance the pick-up of one bag of mixed trash each week. If, or most likely when, High Bridge residents exhaust their supply of stickers, they can purchase more tickets for a fee which is based on the borough's current landfill disposal costs. If disposal fees rise, so do the price of stickers. Solid waste administration costs are not figured into the sticker price. Recyclable trash doesn't require a sticker and is picked up monthly, at the curb, at no cost.

A variation on the you-pay approach is Lane County, Ore., where all landfills and transfer stations offer a $1 rebate off disposal fees to customers who bring in at least 10 pounds of recyclables.

In rural areas where most residents and businesses haul their own trash, a deliberate rise in tipping fees can create a powerful incentive to recycle. Some solid waste management experts claim that rural landfill deposit fees are artificially low and provide little motivation for users, especially commercial haulers, to avoid these costs and recycle a portion of their waste.

Contests, lotteries and prizes offer a different kind of financial incentive. For example, an Ohio city sponsors a monthly lottery for all participants in the curbside recycling program. Residents contribute their names and addresses, via their recycling bins, and from the total collection one lucky winner is drawn.

Mandatory recycling – Mandatory recycling means mandatory source separation, a legal requirement that residents separate recyclable trash from non-recyclable trash prior to disposal. Although voluntary recycling remains the most common option, mandatory programs are gaining popularity. Acceptance is particularly high in large communities where proposals for incinerators are defeated, and recycling becomes a renewed priority.

But putting the law behind recycling does not guarantee community support. Patrick Walsh and Philip O'Leary, solid waste specialists at the University of Wisconsin-Madison, caution that mandatory programs will not run themselves just because it is the law to recycle. Compared to voluntary efforts, these programs probably experience greater scrutiny and initial skepticism from regulated citizens, they say.

The mechanics of mandatory source separation follow the community's waste disposal practice. For example, if residents have the option of hauling their own trash to the landfill, recycling may be mandatory only for those residents. This is the case in Peterborough, N.H., where half of all residents self-haul and are required to separate and deposit recyclables in special bins at the landfill. All other residents hire

private trash haulers for curbside service, which is far more expensive. A more common practice in mandatory programs is to require residents to separate and place recyclables at the curb.

Mandatory source separation ordinances should be clear, comprehensive and patterned after the community's particular needs and resources. Walsh and O'Leary recommend that the ordinance cover the following points:

- why source separation is being imposed;
- to whom the ordinance applies (residents, businesses);
- which items must be separated and how they will be collected;
- any processing required of residents (bundling, cleaning, removing caps);
- collection procedures (drop-off or curbside, days of operation or pick-up);
- penalties for noncompliance.

Mandatory programs, if enforced, divert a good proportion of waste from the landfill. But enforcement is a tricky subject. Penalty for noncompliance may be a fine or, in the case of curbside collection, refusal to pick up mixed trash. Typically, citizens raise initial objection to both enforcement techniques, but compliance and community support usually follow, if public education is conducted simultaneously.

Islip, N.Y., home of the infamous trash barge, has put teeth into its ordinance to enforce source separation. The town issues 20 gallon plastic recycling bins to households for curbside collection, and conducts weekly random checks of regular trash. After two warnings, residents receive a hefty $500 fine for including recyclables in the regular trash. But, the first household found complying with the local ordinance wins a free dinner for two at an Islip restaurant.

Lotteries without penalties were used by an Illinois city that selected one household's trash and checks for prohibited items—newspapers and aluminum cans. If the trash contains only non-recyclable materials, the household was rewarded with a check for at least $1,000. Otherwise, $1,000 is added to the pot for the next drawing.

Refusal to pick up trash containing recyclables is the most direct enforcement strategy. In Prairie du Sac, Wisc., residents are required to place recyclables in clear plastic bags supplied free of charge by the village. The hauler inspects trash bags periodically and refuses to collect any bags containing recyclables. Special stickers indicate why the refuse was not picked up; they say "recyclables in garbage" or "garbage in recyclables".

State mandates -- Eight states now mandate recycling, and proposals are pending in many other state legislatures. The requirements and responsibilities directed by state government vary considerably.

Some states offer financing to local governments to initiate recycling programs or solid waste management planning. Pennsylvania's 1988 law reimburses townships and cities for 90 percent of the cost of starting local recycling. The self-supporting program is financed through a $2 per ton surcharge on waste deposited in any of the state's landfills or resource recovery facilities.

Before spearheading voluntary or mandatory recycling activities in your community, check with the state environmental agency to see what technical and financial programs may be available.

processing recyclables

Processing recyclables, or preparing them for market, follows collection. Some materials must be reduced in volume by crushing, shredding, or flattening, or upgraded by removing contaminants and unusable parts.

Processing can be lucrative. A New Jersey recycling facility reports that crushed glass sells for $40 to 60 per ton while whole bottles sell for half that price. But processing demands time, equipment and staff, and the buyers' specifications must be followed to the letter. Recycling is more apt to be cost-effective when processing, along with marketing, is conducted on a regional basis. Few small communities produce a sufficient volume and variety of recyclables to justify their own processing operation.

Pairing local collection with regional processing and marketing is the successful strategy of Peterborough, N.H. As a member of the New Hampshire Resource Recovery Association, Peterborough works with 65 other towns to identify buyers, develop contracts with manufacturers, negotiate a floor price for certain products, and guarantee that materials are processed in a way that meet buyers' specifications.

Sullivan Township, which is not a member of any area recycling association, collects recyclables locally, then hands over the materials to the Ashland (County) Recycling Center for processing and marketing.

Whether materials are processed or left intact, recyclables must be transported to the buyer or intermediary. The Minnesota Project recommends that programs start out by asking the buyer or intermediary to arrange for and finance transport, or by leasing—not buying—local trucks for delivery.

Equipment needs -- Most recycling programs start out underequipped and gradually add equipment over time. The type and extent of equipment needed depends upon the recycling activities undertaken (collection, processing and/or delivery), the amount of recyclables handled, the region served, and the funds available to refurbish or purchase equipment. Wherever possible, programs benefit from sharing costs.

Collection equipment can be kept inexpensive and simple. A large enclosed truck or sturdy, oversized barrels and green boxes can serve as drop-off bins. A trash hauling truck or, more simply, a pickup truck pulling a trailer is adequate for most curbside collection programs.

Curbside pickup can be integrated (recyclables and trash are collected in one vehicle equipped with sepa-

rate compartments for the different materials), or separated (recyclables and trash are collected in two vehicles, perhaps at different times on the same day.) Integrated pickup is more efficient, but the cost of purchasing special equipment, if new, may be significant. Separated pickup permits greater flexibility in scheduling collection, but the operational costs are high.

Staffing -- Manpower absorbs the largest chunk of a recycling program's operating budget, and is a nagging problem for small operations. Paid staff is expensive. Volunteer labor is difficult to get and keep, and unstaffed drop-off centers risk receiving mixed, non-recyclable materials. But, with a little ingenuity, manpower woes can be remedied.

Even in an unstaffed program, one person must serve—in a paid or volunteer capacity—as the recycling coordinator. He or she is a liaison among haulers, residents and businesses, and the spiritual leader for public education.

It is the coordinator's responsibility to collect data and maintain records on participation rates, quantity of materials recycled and not landfilled, revenues generated, costs incurred, etc. Recordkeeping is important, because recycling program costs are judged against other waste management strategies. The comparison helps to sustain community support and direct decisions about new recycling equipment investments.

Typically, small recycling programs rely on volunteers to sort, crush, shred and bundle recyclables. The work can be enormously labor intensive and unpleasant in summer heat. The trick to using volunteer labor successfully is to tie the recycling operation to one or more volunteer organizations, to give the program a sponsor. Social service groups such as Lions, Kiwanis, Girl and Boy Scouts and religious organizations are likely sponsors.

Manpower problems may also be resolved by teaming up with disabled workers. Sheltered workshops, which provide employment for developmentally disabled adults, are the centers for many recycling operations.

Government programs offer another manpower option. Every month, public workfare recipients collect Sullivan's recyclables. In New Jersey, an innovative community service program in county probation departments gives some offenders the opportunity to pay something back to their communities, by working for a local recycling program.

How you ultimately design your recycling program will depend largely on the makeup of your community and how you currently are handling trash pickup. It will be up to you, as a local leader, to analyze your community and the prospects available for various approaches to recycling — approaches that will guarantee long term success.

design options for recycling program

Sponsors of recycling

- local government
- private haulers
- non-profit organizations
- combination of sponsors

Collection techniques

- drop-off centers
- curbside pickup
- buy-back (redemption) operations
- combination of collection techniques
- voluntary participation
- mandatory source separation
  - by local ordinance
  - by state law

Penalties/incentives

- refusal to pick up unseparated trash
- additional charge levied against unseparated trash
- free pickup of recyclables
- prizes for top recyclers

chapter 5

educating the public

"A little learning is a dangerous thing."

--Alexander Pope

Too little "learning" by community residents can mean the end of your recycling program before it ever gets underway. Successful recycling programs depend on widespread participation. Individuals and businesses must support recycling, practice recycling, and maintain the effort over a long period of time. And the only way to convince your community that a recycling program is important is by educating it to local solid waste problems and to the local benefits of recycling.

Many of the successful recycling programs discussed in this book share certain characteristics: early involvement of community leaders and citizen representatives in building support for recycling, broad-based educational efforts using the media, public forums, personal contacts to explain how and why recycling works, and ongoing promotional efforts.

who will lead?

Public education efforts should start with the establishment of a citizens recycling committee or coalition. The group should be organized as soon as the recycling idea hits the table. Your committee can be made up of a group already in place or one established especially for the recycling effort. But the key to the committee's success lies in its makeup. Participants must be people dedicated to the community and to the success of recycling — local government officials, civic and religious leaders, trash haulers, business people, educators, local media, high school organizations, senior citizens groups, environmentalists. This group can make or break your recycling program.

The committee should help the lead organization — the local government, for example — from conception of a recycling idea to implementation of the program. They should provide input into initial planning from a broad range of community perspectives. They should be used to study aspects of program development, such as community attitudes because the disposition of your community toward recycling may decide what direction your initial educational efforts will take.

Are people aware that there is a solid waste problem? Are people aware of how much trash is generated in their community? Are people concerned with landfill problems? Do people know about new landfill regulations that will make it more difficult and more expensive to operate a landfill? Do people know how easy it can be to recycle? Do people understand the benefits to their community that can come from recycling? These are just a few of the questions your committee can put before the community. The answers to these questions will focus your initial educational efforts.

kicking off the campaign

When local officials in Morton, Wash., were con-

sidering some sort of recycling program, they mailed a survey to every member of the community. The survey listed different types of possible programs and asked residents which they would prefer. After results were compiled, the city decided to go with a food and yard waste program that would result in a high quality top soil.

Surveys can also be taken door-to-door by a school group or church group willing to volunteer the necessary time. Local officials not familiar with survey techniques or the type of questions to ask to get the most productive answers should contact a nearby community college or the local extension service for help.

In a letter signed by all government officials of Sullivan Township, Ohio, residents were notified that the township was initiating a voluntary recycling program through the regular trash pickup program. The letter told residents why a recycling program was being set up, advised them how they could sign up for the program, told them what items would be recycled and how and when they would be picked up. It also noted the time and place of a public meeting to discuss the project.

The extent to which citizens will need to be educated about recycling will vary from community to community. Your committee's initial research should provide you with an idea as to how "savvy" your residents are about environmental problems and recycling in particular.

"RECYCLING" SO SIMPLE - IT WORKS
RECYCLING CENTERS NEAR YOU-
OPEN 9:00 AM 5:00 PM
- Springbrook Shopping Plaza
- Newberg Shopping Plaza
- Sentry
- Naps
- Dundee Fire Dept.
- Newberg Transfer & Recycling Center
- Newberg FISH Emergency Services
Newspaper
Cardboard
Glass Bottles & Jars
Used Motor Oil
Food Cans
Aluminum
For information & free brochure call Newberg Garbage Service
538-1388
OREGON LAW STATES THAT EVERY OREGONIAN BE GIVEN THE OPPORTUNITY TO RECYCLE

We're all creatures of habit. Recycling will require people to alter their habits. But people can be influenced to change their habits if they perceive that change as worthwhile, first from a personal standpoint and then from a community-wide standpoint.

When it comes to recycling, people tend to be swayed by the local benefits that can be derived from such a program. **Educational efforts then should be specific about the community's particular problems.** Explain that the local landfill is rapidly filling up and that recycling can help extend the facility's life. Explain that tipping fees are getting higher each year, with no particular end in sight, and that tax money can be saved by reducing the amount of trash landfilled. Actual or potential environmental problems caused by current waste management practices should also be discussed. If you find your community is particularly conscious about environmental concerns, then emphasize the "save the planet" arguments.

Simply beautifying the community is another argument that should not be overlooked. Residents of Hopkinsville, Ky., were strongly motivated to participate in a glass recycling project because of pride in their historic town and the beauty of public parks.

Solid waste specialists at the University of Wisconsin-Madison, Patrick Walsh and Philip O'Leary, suggest developing specific program goals and then publicly discussing these goals as a way of generating community support and of responding to any initial criticism of a recycling program. For example, you may argue for the need to reduce the amount of trash you take to the landfill by 25 percent. If so, show people what this 25 percent translates to in terms of money not spent and in terms of extending the life of a landfill. If you can turn recycling into an economic development opportunity, talk about jobs that can be created.

Public forums may offer another way to determine attitudes toward recycling, especially if you can get a broad range of people to attend. The problem for any organizer of such a forum is that the people who attend may well be those who are very much for or very much against a particular issue.

Door-to-door visits are used as a means of getting out the word on recycling. Newberg Garbage Inc., of Newberg, Ore., has a contract with the city to pick up solid waste. It also has a mandate from the state to inform all residents that they have the opportunity to recycle. Since the company is actively involved in recycling, company representatives go door-to-door to talk personally with residents about recycling and to explain the program. It also is a quick and effective way to reach newcomers to the community.

Involve as many community organizations as possible to help you "sell" your recycling program. If your community has a high percentage of young people, tie the educational and promotional efforts to the schools. If it is highly political and strongly influenced by local government leaders, focus on municipal-related efforts and benefits. If civic or religious groups are the focal point of your community, utilize them. Become a "public speaker" and volunteer to be a guest at civic meetings as a way of getting the recycling message across to a variety of people.

the media for the message

Once you have done your initial community analysis and established your goals, start your "media blitz."

Assign one person on the committee to deal with the media. That person should be familiar with all media you want to utilize, and that person should know about deadlines. Schedule a press conference. The very idea that your town is holding a press conference lends an air of importance to what you're going to announce. Try to hold the conference at a time that will be the most convenient for the type of media in your area. If you have weekly newspapers that are published on Wednesday of each week, schedule your conference for Thursday or Friday. Daily newspapers that are published in the afternoon have a very different work schedule from newspapers that are published in the morning, so schedule your conference accordingly. Check with radio and television stations to find out what times reporters are available to cover events.

Your media contact should call newspapers, radio stations and television stations to tell them about the upcoming press conference and give them a broad outline of what will be discussed. Have handouts prepared, particularly if you have pulled together any figures on what it costs to landfill and what benefits can be derived from recycling. Talk about what materials will be recycled, and how collection will be made. Make sure the media know that your decisions regarding recycling are also based on a survey of community attitudes and interests. Have two or three people available at the head table to answer questions from the media — a local government official, a member of the committee, or a bright youngster who can discuss recycling. The right youngster can almost steal the show from older members of the panel, particularly with the television medium.

announcing by mail

Deliver or mail a flyer to every residence announcing the recycling program. Time this to the appearance of your media announcement so residents will get a "double hit." In addition, post flyers in windows of local businesses and on community bulletin boards and church bulletin boards. Ask civic groups to hand the flyers out at meetings. If possible, provide enough flyers for teachers to pass out in each classroom if school policy allows.

Trace Industries, of Hopkinsville, Ky., placed flyers printed in red ink in stores all over the community. The flyer explained what was being recycled, how recycling would help the community, how residents should handle glass for recycling, and the hours when glass could be brought to the recycling center.

Flyers should contain the above information, plus the start-up date if the flyer is advanced publicity. One flyer, however, will not be enough. The number you send out depends on several things: how easy it is and how inexpensive it is to produce the flyers (or whether the effort is receiving outside funding), the type of delivery system used (volunteers going house-to-house or mail), and the extent of your recycling program. If you're only recycling newspapers and cardboard, instructions can be fairly straight forward. But if your recycling program is going to include glass, aluminum cans, paper, plastics, your second flyer should detail how each item is to be separated and handled. It must stress the importance of proper separation. Advise the residents of the type of containers that will be used — ordinary trash cans with special labels affixed ("glass", "aluminum"), see-through trash bags, color-coded containers.

tying it all together

While your flyers are going out in the mail or being delivered, contact your local newspaper to see if it will carry an announcement, possibly set off with a border, as a public service, giving the date that recycling starts in your town. If the announcement has to be an ad, ask about possible cost savings if the same ad is run each week. Radio and television stations are required by federal law to devote a certain amount of air time to public service announcements and programming. Ask radio stations to run public service announcements about your recycling startup dates.

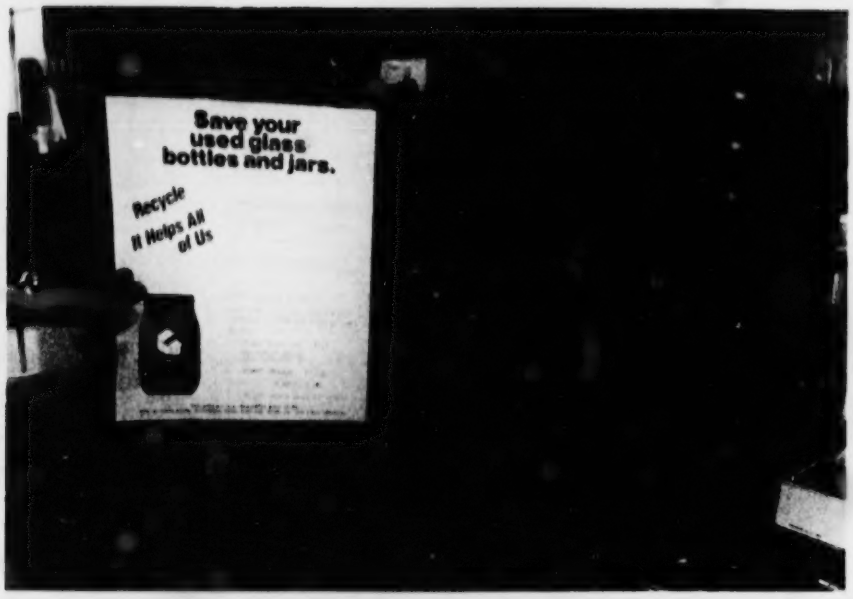
Check with area utilities and trash haulers that service the community to see if they will mail a recycling notice with monthly bills. If you use this approach, you'll need to know when the utility or trash hauler needs your flyer for insertion. You'll need to know the size envelope used by the company. All may not use the same size, which will mean the same notice cannot be used by everyone. Keep the notice simple and compact so it will be as easy as possible for the utilities and others to handle.

The week before recycling starts (if you're dealing with a weekly newspaper), contact the media again and provide them with copies of all the flyers you've sent out and reiterate other pertinent information, such as the date recycling will start, regular pickup schedules, and all information on exactly what is being recycled. Try to get local radio stations to run your announcements each day, starting two or three days before your recycling program is launched.

ongoing publicity, education

The initial flurry of activity that launched your recycling program is over; the first recycling pickup has been made, and initial enthusiasm for publicity has waned. The need for education is as strong as ever if your community plans to have a long-term, successful program. Ongoing publicity keeps recycling in front of the community, helping to reinforce the recycling message and motivating people to participate, as well as indoctrinating new residents. Promotional efforts should highlight the program's progress and accomplishments as well as reiterate its benefits and procedures.

But all newspapers — even small town weeklies — reach a point where they believe a program is "no longer news." Ongoing publicity, then, means coming up with a different approach to getting your



Trace Industries, of Hopkinsville, Ky., distributed flyers, done in several sizes, to stores throughout the community for prominent display. The same flyer also serves as an 8-1/2x11 sheet that can be mailed out or handed out at meetings of local civic groups, religious groups, in schools, or even on the streets.

Photo by Maguire-Reeder, Ltd.

information in the newspaper or on local radio.

The media person should contact the local newspaper editor and present a plan for a regular monthly column. (A weekly column may require more space than the editor is willing to give and you may well not have enough varied information to write about on a weekly basis.) If the editor agrees, set up an issue in which the column will appear every month, and devise a "standing" headline or logo for the column so that it will become familiar to local residents. Columns should be tied in with any special events that involve recycling. They should also keep residents updated on the benefits of recycling, as well as provide them with information on new recyclable packaging or products. This sort of information can be obtained by getting on the mailing list of various organizations associated with recycling, and on the list to receive publications from the U.S. Environmental Protection Agency.

It should be the responsibility of the media person either to write the column or to find another person (or persons) willing to do the job. It should also be the media person's responsibility to see that the column gets to the newspaper office well before the deadline. Such a column may well be the best -- and certainly least expensive -- way to keep your recycling program before local residents. Its major drawback may be that you will have a limited space in which to discuss an issue. In addition, you should contact a local radio station to determine if there is a "talk show" or public service slot that could feature regular information on the community's recycling efforts. Again, this activity should be assigned to one person who can be relied upon to pre-record the messages on a regular basis or appear at the radio station when needed.

Don't forget television. The visual media can have a dramatic impact, particularly in the early stages when you're outlining the need for a recycling program. It can have the same effect on your first pick-up day. But ongoing educational publicity may be harder to come by on television than in other media. However, television has to comply with the same federally imposed regulations on public service announcements and public issue programming that affect radio. Talk with your local station manager to see how your recycling efforts might fit in with public service programs. The manager may have suggestions for ways you can produce inexpensive messages.

special events to rekindle interest

Special events can also be used to re-awaken media interest in your project. Plan a "hazardous materials" day in which each household is asked to bring those everyday cleaning products and other items that actually are considered hazardous. A pile of hazardous cleansers, bleach bottles, paint cans, paint thinners, batteries and other items will bring home dramatically how much of our everyday items are polluting our landfills. Before you create that pile of hazardous materials, however, you will want to make sure you have planned a method of disposing of them.

A regular recycling newsletter has several advantages: you can get in more information; you can use artwork; you can distribute it widely. The disadvantage is money. A newsletter will cost more to produce and it will take much more time. If money is a problem, look into the possibility of asking local businesses—and even local residents—to underwrite the cost of publication and mailing. As an enticement, the community could offer the sponsors space in the newsletter that would say "This newsletter brought to you as a public service by Joe's Garage, Stan's Barber Shop, etc."

Morton, Wash., for example, distributes the "Worm Report," so named because special red worms are used it the city's composting project. Sullivan Township officials send out letters to all residents updating them on the progress of the voluntary program. The first letter contained a statistic that hit close to home: the 1,037 pounds of recyclables collected and taken to the recycling center paid the township $24.61; the 12,600 pounds of trash taken to the landfill cost the township $58.59. Every subsequent letter sent out by township officials included the amount of materials picked up for recycling, the amount of money received from recyclables, the amount of trash still going to the landfill, and what it costs in tipping fees.

Pamphlets should be a regular part of your ongoing educational program. Pamphlets can contain all your arguments for a recycling program, all instructions on how to recycle, in short, all information — in one place — that even the newest resident will need. These can be distributed regularly through schools, civic organizations, churches, senior citizens organizations, at the town hall, through the chamber of commerce or other business organization. Pamphlets have the same disadvantage as newsletters: they can be expensive to produce. But one way to reduce the expense is to "sell" listings on the pamphlet to local businesses.

Newberg Garbage Service Inc. has a standard four-page publication that includes all information — what is being recycled, how it must be handled, drop-off sites and times, pick-up schedule, plus interesting tidbits on the value of recycling ("Recycling a ton of steel results in an energy use reduction of 74 percent").

Tiff County, Ga., and the City of Tifton have gone even farther in their on-going promotion of recycling with the "Recycling Rover," an old school bus that has been converted into a mobile recycling learning center. "Rover" goes to schools, community functions, and major state activities, spreading the word. The project was paid for through materials and cash contributions from recycling companies, local businesses and industries and from in-kind services.

State or national organizations involved in recycling may have produced promotional materials that cover recycling in a more "generic" fashion. These materials can often be purchased at modest cost (some are even free) and used as educational tools in elementary or even high school. Similar programs may be available from your state as well. Some companies, such as aluminum can manufacturers, publish pamphlets that can be personalized with your community's name and a short message.

The Oregon State Department of Environmental Quality, for example, produced a waste reduction curriculum for kindergarten through 12th grade that includes guidelines for establishing an in-school recycling program. The guidelines emphasize student involvement in all aspects of the program from conducting materials and market studies to organizing and carrying out an educational and promotional campaign to designing and making the containers for collecting recyclables. School-age youngsters can also exert a lot of influence on their parents when it comes to recycling.

"knowledge is power"

How well you educate your citizenry to the need for recycling will determine how involved they become in the program. How well you continue to educate them will determine how devoted they become to recycling as a "life style." Their involvement and devotion will, in turn, guarantee the success of any community's recycling program.

summary

recycling revisited

Recycling is the reuse of waste products to make new products. Hundreds of small and rural governments have included recycling as part of an integrated management approach to the disposal of solid waste.

By recycling one or more materials, communities have been able to extend the life of their landfills, lower tipping fees and incineration costs, and remove environmentally hazardous materials.

The feasibility and financial impacts vary from community to community, but the successful programs cited in this guidebook have addressed the following issues:

Solid Waste Problems — Local leaders analyzed the cost and availability of landfill space while there was time to explore alternatives. The composition and volume of the local waste stream were reviewed to determine what products could be recycled for financial and environmental reasons.

Locating Markets — While most products now have a secondary use, recycling depends on finding steady and accessible markets. Buyers respond to guaranteed supply levels and product specifications, and many small communities have joined together in regional or cooperative marketing arrangements. The cost of disposal alternatives, the distance and availability of markets, and environmental concerns all must be weighed in the decision to recycle.

Program Design — A recycling program must deliver recycled materials from their source to the market place. This process involves four steps: separation, collection, processing, and transportation. Local governments have often cooperated with service organizations, private haulers, and industry itself to provide these services.

Public Education — Community understanding and support are essential for a successful, ongoing recycling program. The public should understand the goals and benefits of recycling before the program starts as well as recycling procedures once the program begins. Regular promotion, special events, and publicity on the financial benefits help sustain enthusiasm and participation levels.

The successful programs explored in this guidebook have resulted in the appropriately scaled recycling strategies recommended here. With them, we hope small and rural communities will be better able to develop realistic answers to the question: "Why Waste A Second Chance?"

appendix a

state government recycling agencies

ALABAMA
Dept. of Envtl. Mgmt.
State Capital
Montgomery, AL 36104
(205) 271-7700

ALASKA
Dept. of Envtl. Conserv.
Pouch O
Juneau , AK 99811
(907) 465-2666

ARIZONA
Conservation Programs
Energy Office
1700 W. Washington St.
Phoenix, AZ 85007
(502) 255-3303

ARKANSAS
Solid Waste Mgmt. Div.
Dept. of Pollution Control and Ecology
8001 National Dr.
Little Rock, AR 72219
(501) 562-7444

CALIFORNIA
Recycling Div.
Dept. of Conservation
819 19th St.
Sacramento, CA 95814
(916) 323-3508

COLORADO
Land Pollution Control Sect.
Hazardous Materials & Waste Management Division
Dept. of Health
4210 E. 11th Ave.
Denver, CO 80220
(303) 320-8333

CONNECTICUT
Solid Waste Mgmt. Unit
Dept. of Environmental Protection
State Office Building
Hartford, CT 06106
(203) 566-5847

DELAWARE
Solid Waste Branch
Dept. of Natural Resources and Environmental Control
89 Kings Highway
P.O. Box 1401
Dover, DE 19903
(302) 736-5742

DISTRICT OF COLUMBIA
Dept. of Public Works
Adm. of Public Space Maintenance
Washington, DC 20032
(202) 767-8512

FLORIDA
Dept. of Environmental Regulation
2600 Blairstone Rd.
Tallahassee, FL 32399-2400
(904) 488-0300

GEORGIA
Georgia Clean and Beautiful
40 Marietta St., NW 8th Fl.
Atlanta, GA 30303
(404) 656-3898

HAWAII
Dept. of Health
P.O. Box 3378
Honolulu, HI 96801
(808) 548-3400

IDAHO
Dept. of Health & Welfare
State House
Boise, ID 83720
(208) 334-2789

ILLINOIS
Dept. of Energy & Natural Resources
325 W. Adams St., Rm. 300
Springfield, IL 62704-1892
(217) 785-2800

INDIANA
Office of Solid & Hazardous Waste Management
105 S. Meridian St.
P.O. Box 6015
Indianapolis, IN 46206-6015
(317) 232-8883

IOWA
Solid Waste Section
Dept. of Natural Resources
900 E. Grand Ave.
Des Moines, IA 50319
(515) 281-3426

KANSAS
Dept. of Health
& Environment
Forbes Field
Topeka, KS 66620
(913) 296-1500

KENTUCKY
Resources Mgmt. Branch
Div. of Waste Management
18 Reilly Rd.
Frankfort, KY 40601
(502) 564-6716

LOUISIANA
Solid Waste Division
Dept. of Envtl. Quality
Box 44307
Baton Rouge, LA 70804
(504) 342-1216

MAINE
Dept. of Envtl. Protection
Station #17/State House
Augusta, ME 04333
(207) 289-2111

MARYLAND
Environmental Service
2020 Industrial Dr.
Annapolis, MD 21401
(301) 974-3291

MASSACHUSETTS
Div. of Solid Waste
Dept. of Envtl. Quality
Engineering
1 Water St.
Boston, MA 02108
(617) 292-5962

MICHIGAN
Waste Management Div.
Resource Recovery Section
Dept. of Natural Resources
P.O. Box 30028
Lansing , MI 48909
(517) 373-0540

MINNESOTA
Pollution Control Agency
520 Lafayette Rd.
St. Paul, MN 55155
(612) 296-8439

MISSISSIPPI
Non-Hazardous Solid Waste
Section
Dept. of Natural Resources
P.O. Box 10385
Jackson , MS 39209
(601) 961-5171

MISSOURI
Waste Management Program
Dept. of Natural Resources
P.O. Box 176
Jefferson City, MO 65102
(314) 751-3176

MONTANA
Solid & Hazardous Waste
Management Bureau
Dept. of Health & Envtl. Sci.
Cogswell Building
Helena, MT 59620
(406) 444-2821

NEBRASKA
Dept. of Envtl. Control
P.O. Box 94877
State Office Building
Linden, NE 68509
(402) 471-4210

NEVADA
Office of Community Services
1100 E. Williams St.
Carson City, NV 89710
(702) 885-4420

NEW HAMPSHIRE
Office of Waste Management
Department of Health &
Welfare
6 Hogen Drive
Concord, NH 03301
(603) 271-4662

NEW JERSEY
Office of Recycling
Dept. of Energy
101 Commerce St.
Newark, NJ 07102
(201) 648-1978

NEW MEXICO
Solid Waste Management
Health & Environment Dept.
P.O. Box 968
Santa Fe, NM 87504
(505) 827-2780

NEW YORK
Bureau of Recycling
Dept. of Envtl. Conserv.
50 Wolf Rd.
Albany, NY 12233
(518) 457-7336

NORTH CAROLINA
Pollution Prevention Program
Dept. of Natural Resources
and Community Development
P.O. Box 27687
Raleigh, NC 27611
(919) 733-7015

NORTH DAKOTA
Div. of Waste Mgmt. &
Special Studies
Dept. of Health, Rm. 302
Bismarck, ND 58505
(701) 224-2366

OHIO
Div. of Litter Control & Recycling
Dept. of Natural Resources
Fountain Square
Columbus, OH 43224
(614) 265-6353

OKLAHOMA
Solid Waste Division
State Dept. of Health
1000 NE 10th St.
Oklahoma City, OK 73152
(405) 271-7159

OREGON
Dept. of Envtl. Quality
P.O. Box 1760
811 Southwest 6th Ave.
Portland, OR 97204
(503) 229-5826

PENNSYLVANIA
Recycling & Energy
Recovery Section
Dept. of Envtl. Resources
P.O. Box 2063
Harrisburg, PA 17120
(717) 787-7382

RHODE ISLAND
Dept. of Envtl. Management
83 Park St.
Providence, RI 02903
(401) 277-3434

SOUTH CAROLINA
Bureau of Solid and Hazardous
Waste Management
Dept. of Health and Envtl Control
2600 Bull Street
Columbus, SC 29201
(803) 758-5681

SOUTH DAKOTA
Alternative Energy Programs
Office of Energy Policy
State Capitol Building

Pierre, SD 57501
(605) 773-3603

TENNESSEE
Div. of Solid Waste Mgmt.
Dept. of Health & Environment
701 Broadway, 4th Fl.
Nashville, TN 37219-5403
(615) 741-3424

TEXAS
Div. of Solid Waste Mgmt.
Dept. of Health
1100 W. 49th T-610A
Austin, TX 78756-3199
(512) 458-7271

UTAH
State Recycling Program
150 W. North Temple St.
P.O. Box 2500
Salt Lake City, UT 84110
(801) 538-6170

VERMONT
Dept. of Envtl. Conserv.
103 South Main St.
West Office Building
Waterbury, VT 05676
(802) 244-8702

VIRGINIA
Dept. of Conserv. & Historic Resources
1215 Washington Building
Capitol Square
Richmond, VA 23219
(804) 786-8679

WASHINGTON
Recycling & Litter Control
Mail-Stop PV77
Olympia, WA 98504
(206) 459-6257

WEST VIRGINIA
Waste Management Division
Dept. of W.Va. Natl Resources
1260 Greenbrier Street
Charleston, WV 25311
(304) 348-5935

WISCONSIN
Dept. of Natural Resources
Bureau of Solid Waste Mgmt.
Box 7921
Madison, WI 53707
(608) 267-7565

WYOMING
Dept. of Envtl. Quality
122 W. 25th St.
Herschler Bldg., 4th Fl.
Cheyenne, WY 82002
(307) 777-7752

appendix b

recycling organizations

State Recycling Associations (private and/or non-profit)

Alaska Recyclers Assn.
5650 Camelot Drive
Anchorage, AK 99508

California Resource Recovery Centers
125 W. Swift Ave.
Clovis, CA 93612
(209) 292-3247

Illinois Assn. of Recycling Centers
P.O. Box 2603
Naperville, IL 60565
(217) 351-4584

Michigan Recycling Coalition
P.O. Box 482-107
Ann Arbor, MI 48107
(313) 665-6398

Recycling Assn. of Minnesota
P.O. Box 30632
St. Paul, MN 55175
(612) 646-2591

Nebraska State Recycling Assn.
Route 2, Box 423
Kearny, NE 68847
(308) 237-7339

New Hampshire Resource Recovery Assn.
P.O. Box 472
Concord, NH 03301
(603) 224-6996

Assn. of New Jersey Recyclers
P.O. Box 625
Abescon, NJ 08201
(201) 641-8292

Cornell Waste Mgmt Institute
Center for Envtl. Research
468 Hollister Hall, Cornell Univ.
Ithaca, NY 14853-3501
(607) 255-7535

Federation of Ohio Recyclers
2801 Far Hills Avenue
Dayton, OH 45419
(513) 294-8080

Assn. of Oregon Recyclers
P.O. Box 10051
Portland, OR 97210
(503) 227-1319

Pennsylvania Resources Council
44 East Front St.
Media, PA 19063
(215) 565-9131

Assn. of Vermont Recyclers
P.O. Box 965
Rutland, VT 05701
(802) 775-6482

Washington State Recycling Assn.
P.O. Box 569
Seattle, WA 98111
(206) 363-8433

Wisconsin Coalition for Recycling
111 King St., Room 31-32
Madison, WI 53703
(608) 256-0565

Trade Associations of Recycling Industries

Aluminum Recycling Assn.
1000 16th St., NW
Suite 603
Washington, DC 20036
(202) 785-0550

American Iron & Steel Institute
1000 16th St., NW
Washington, DC 20036
(202) 452-7100

American Paper Institute
260 Madison Avenue
New York, NY 10016
(212) 340-0600

Assn. of Petroleum Re-refiners
P.O. Box 427
Buffalo, NY 14205
(716) 855-2212

Automotive Dismantlers & Recyclers Education Fdn.
1133 15th St., NW
Washington, DC 20005
(202) 293-2372

Can Manufacturers Institute, Inc.
1625 Massachusetts Ave. NW
Washington, DC 20036
(202) 232-4677

Glass Packaging Institute
1801 K St., NW
Suite 1105-L
Washington, DC 20006
(202) 887-4850

Institute of Scrap Recycling Industries, Inc.
1627 K St., NW
Suite 700
Washington, DC 20006
(202) 466-4050

National Tire Dealers & Retreaders Association
1250 I St., NW
Washington, DC 20005
(202) 789-2300

Paperboard Packaging Council
1101 Vermont Ave., NW
Suite 411
Washington, DC 20005
(202) 289-4100

Rubber Manufacturers Assn.
1400 K St., NW
Washington, DC 20005
(202) 682-1338

Society of the Plastics Industry
1275 K St., NW
Suite 400
Washington, DC 20005
(202) 371-5200

Technical Association of Pulp & Paper Industries
P.O. Box 105113
Atlanta, GA 30348
(404) 446-1400

Textile Fibers & By-Products Assn.
P.O. Box 11065
Charlotte, NC 28220
(704) 527-5593

Tire Retread Information Bureau
26555 Carmel Rancho Blvd.
Suite 3
Carmel, CA 93923
(408) 625-3247

appendix c

selected annotated bibliography

manuals/books

Case Studies in Rural Solid Waste Recycling, 1987, The Minnesota Project, 2222 Elm Street, S.E., Minneapolis, Minn. 55414. (612) 378-2142. $8; bulk discounts available.

Waste: Choices for Communities, 1988, Concern, Inc., 1794 Columbia Road, N.W., Washington, D.C. 20009. (202) 328-8160. $3.00.

Comprehensive Curbside Recycling: Collection Costs and How to Control Them, 1988, Glass Packaging Institute, 1801 K Street, N.W., Suite 1105-L, Washington, D.C. 20006. (202) 887-4850. Free.

Coming Full Circle: Successful Recycling Today, 1988, Environmental Defense Fund, 257 Park Avenue South, New York, NY 10010. (212) 505-2100. $20 ($10 for EDF members).

Waste to Wealth: A Business Guide for Community Recycling Enterprises, 1985, Institute for Local Self-Reliance, 2425 18th Street, N.W., Washington, D.C. 20009. (202) 232-4108. $35. Publications list available upon request.

Multi-Material Recycling Manual, Second Edition, 1987, Keep America Beautiful, Inc., 9 West Broad Street, Stamford, Conn. 06902. (203) 323-8987. $40 plus $4.00 postage/handling per copy.

reports

Characterization of Municipal Solid Waste in the United States, 1960 to 2000, updated 1988, Franklin Associates, Ltd., 4121 West 83rd Street, Suite 108, Prairie Village, Kan. 66208. (913) 649-2225. $15.

Background Document for the Governor's Select Committee on Recycling and the Environment, 1988, Minnesota State Planning Agency, Director of Environmental Research, 300 Centennial Building, 658 Cedar Street, St. Paul, Minn. 55155. (612) 296-3985. $4.00.

magazines/journals

Resource Recovery (bimonthly), National League of Cities, 1301 Pennsylvania Avenue, N.W., Washington, D.C. 20004. (202) 626-3150. Free as of January 1989.

Biocycle: journal of waste recycling (monthly), Box 351, Emmaus, Pa. 18049. (215) 967-4135. $55 per year.

Resource Recycling (seven times a year), 1218 N.W. 21st Street, Portland, Ore. 97210. (503) 227-1319. Subscription $27/year; sample copy free.

Waste Age (monthly), and **Recycling Times,** National Waste Management Association, 1730 Rhode Island Ave., N.W., Washington, D.C. 20036. (202) 659-4613. Call and ask for subscription card entitling your community to a free subscription.

Phoenix Quarterly, Institute of Scrap Recycling Industries, Inc., 1627 K Street, N.W., Washington, D.C. 20006. (202) 466-4050. Free.

school curriculum

Re:Thinking Recycling: an Oregon Waste Reduction Curriculum, 1987, Oregon Department of Environmental Quality, 811 S.W. 6th, Portland, Ore. 97204. (503) 229-6046. Free for Oregon educators; $15 for others.

"The Wizard of Waste" and **"Trash Monster"** available from the California Waste Management Board, 1020 9th Street, Suite 300, Sacramento, Calif. 95814. (916) 322-3330 (ask for Resource Conservation Division.) Free.

Waste: A Hidden Resource. Keep America Beautiful, 9 West Broad Street, Stamford, Conn. 06902. (203) 323-8987. $55, plus $5.50 postage/handling.

U.S. Environmental Protection Agency

The following publications are available at no charge from EPA's Office of Solid Waste and Emergency Response. Request by calling 1-800-424-9346:

"The Solid Waste Dilemma: An Agenda for Action" - final report to Congress

"Recycle" - general information brochure

"Used Oil Recycling Bulletins" published 3 times a year

"How to Set Up A Local Used Oil Recycling Program"

"Survey of Household Hazardous Waste Related Collection Programs"

"Office of Solid Waste Documents in Demand: A Catalog of Hazardous and Solid Waste Publications"

"Study and Assessment of Eight Yard Waste Composting Programs Across the U.S." Available by writing Richard Kashmanian, Regulatory Innovations Staff, Office of Policy, Planning & Evaluation (PM-223), EPA, 401 M Street S.W., Washington, D.C. 20460

appendix d

financing sources

"Where can I find the funds to start-up a recycling program?" is a common question. Presented below is a helpful, but not all inclusive, outline of financing options. Keep in mind that many costs, especially those for expensive equipment or marketing and processing activities, can be shared among recycling operations.

Local government funds

General tax revenues • Funds derived from the sale of assets (e.g., equipment, land, electricity) • Dedicated revenues from various taxes and surcharges (e.g., on curbside collection or landfill deposit) • Financing instruments (tax increment financing, revolving loan fund) • Grants from higher levels of government (e.g., state recycling financing programs) • Community Development Block Grant – a grant to local government may result in loan to recycling business or may establish a revolving loan fund

State government funds to private and non-profit recycling operations

State departments or divisions of environmental resources, commerce, economic development, community development, litter control, and corrections

Federal government funds to private and non-profit operations

Farmers Home Administration Business and Industry Loans • Small Business Administration loans and loan guarantees • Funds from independent agencies (Tennessee Valley Authority, Appalachian Regional Commission)

Funds targeted to special districts

Districts such as regional planning/development districts and resource conservation and development districts • U.S. Department of Commerce funds, if jobs are created (Economic Development Administration planning grants, Title IX grants for revolving loan funds) • U.S. Department of Agriculture Resource Conservation and Development Program • Special state funds are districts

Grassroots financing

Small, easily organized and low-key fundraising activities like bake sales, rummage sales, holiday parties • Major fundraising events like community-wide auctions, charity balls, concerts, festivals, lotteries, sports events • Capitalizing a local development corporation/foundation by selling shares of stock to interested community investors • Membership dues from association participants (e.g., clean-up association, chamber of commerce, environmental action chapter) • Contributions from area foundations, corporations, small businesses and utilities • Conventional financing from community banks.

NATaT and the National Center for Small Communities

The purpose of the National Association of Towns and Townships (NATaT) is to strengthen the effectiveness of towns, townships and small communities through technical assistance programs, and to promote their interests in the public and private sectors.

NATaT is a non-profit membership organization offering a wide variety of educational services and public policy support to local government officials from more than 13,000 towns, townships and small communities throughout the United States.

Developing effective federal policy

Through its National Center for Small Communities, the association conducts research and develops public policy recommendations which are scaled to the unique needs and nature of rural governments and small towns. By analyzing federal and state initiatives, and disseminating information about them, NATaT and the Center keep local officials abreast of decisions and actions of National import, so they can better manage change in their communities.

Education and information

NATaT's educational conferences, training, workshops, specialized publications and audio visual resources help small town officials cope with change in their communities — and improve the quality of life for rural people. The association's annual conference for small town officials is the largest town meeting in the nation. It focuses on federal programs and policies affecting small communities. The association publishes a monthly news journal, *NATaT's Reporter*, which is the only national source of intergovernmental policy news and "how-to" information written exclusively for small town officials. The journal's topics range from community and economic development, to road surface management, to bridge building, and solid waste management.

Other "how-to" publications cover hazardous materials training for first responders, what to look for when hiring consultants and more. Coming in the near future is a guidebook on wastewater treatment facilities.

For a copy of our free information brochure and resources listing, please contact the National Association of Towns and Townships, 1522 K Street, N.W., Suite 730, Washington, D.C. 20005, or call (202) 737-5200.